THE

# AMERICAN JOURNAL

OF THE

# MEDICAL SCIENCES.

EDITED BY

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## *TO READERS AND CORRESPONDENTS.*

The following works have been received:—

A Treatise on the Continued Fevers of Great Britain. By CHAS. MURCHISON, M.D., F.R.C.P., Senior Physician to the London Fever Hospital, &c. &c. &c. London: Parker, Son & Bourn, 1862. (From the Author.)

Cruelty to Animals. Report of Proceedings at an International Congress, held at the Crystal Palace, Sydenham, on the 11th, 12th, and 13th of August, 1862, to "Discuss the general subject of Cruelty to Animals, and especially Vivisection and other operations upon Living Animals, for the purpose of instruction in Surgery." Ordered to be printed by the Royal Society for the Prevention of Cruelty to Animals. 12 Pall Mall, London. (From JOHN COLAM, Esq., Secretary of the Society.)

Practical Lithotomy and Lithotrity; or, An Inquiry into the best Modes of removing Stone from the Bladder. By HENRY THOMPSON, F.R.C.S., of University College Hospital; Consulting Surgeon to the St. Marylebone Infirmary, &c. London: John Churchill & Sons, 1863. (From the Publishers.)

A Practical Treatise on Fractures and Dislocations. By FRANK HASTINGS HAMILTON, A.B., A.M., M.D., Prof. Military Surgery and Hygiene, &c., in Bellevue Hospital Medical College, &c. &c. &c. Second edition, revised and improved. Illustrated with 285 wood-cuts. Philadelphia: Blanchard & Lea, 1863. (From the Publishers.)

Clinical Lectures on Diseases of Women. By J. Y. SIMPSON, M.D., F.R.S.E., Prof. Med. in Univ. Edinburgh. &c. &c. Illustrated with 102 engravings on wood. Philadelphia: Blanchard & Lea, 1863. (From the Publishers.)

Chemistry. By WILLIAM THOMAS BRANDE, D.C.L., F.R.S.L. & E., &c. &c., and ALFRED SWAINE TAYLOR, M.D., F.R.S., Prof. Chem. and Med. Jurisp. in Guy's Hospital. Philada.: Blanchard & Lea, 1863. (From the Publishers.)

A Practical Handbook of Medical Chemistry. By J. E. BOWMAN, F.C.S., formerly Prof. Chem. in King's College. Edited By CHAS. L. BLOXAM, Prof. of Pract. Chem. in King's College. Third American, from fourth and revised London edition, with illustrations. Philadelphia: Blanchard & Lea, 1863. (From the Publishers.)

Physiological Memoirs. By WM. A. HAMMOND, M.D., Surgeon-General U. S. Army, F.C.P.P., &c. &c. &c. Philadelphia: J. B. Lippincott & Co., 1863.

Catalogue of the Army Medical Museum, Surgeon-General's Office, Washington, D. C., January 1, 1863. Washington. (From the Surgeon-General.)

Proceedings of the Academy of Natural Sciences of Philadelphia. Nos. 1, 2. 1863.

Researches upon the Anatomy and Physiology of Respiration in the Chelonia. By S. WIER MITCHELL, M.D., and GEORGE R. MOREHOUSE, M.D. Washington ity, 1863. Published by the Smithsonian Institution. (From the Authors.)

A Manual of Minor Surgery. By John H. Packard, M.D., Demonstrator of Anat. in Univ. of Penna., &c. &c. With 145 illustrations. Philadelphia: J. B. Lippincott & Co., 1863. (From the Publishers.)

Preliminary Report on the Eighth Census, 1860. By Jos. C. G. Kennedy, Superintendent. Washington, 1862. (From the Author.)

Twentieth Annual Report of the Managers of the State Lunatic Asylum, New York, for the year 1862. Albany, 1863.

Forty-sixth Annual Report on the State of the Asylum for the Relief of Persons deprived of the Use of their Reason. Philadelphia, 1863. (From J. H. Worthington, M. D.)

Eighth Annual Report on the Births, Marriages, and Deaths in the City of Providence, for the year 1862. By Edwin M. Snow, M. D., Superintendent of Health and City Registrar. Providence, 1863. (From the Author.)

Report of the Board of Managers and Medical Superintendent of the Kentucky Eastern Lunatic Asylum (at Lexington, Ky.), for the year 1862. Frankfort, Ky., 1863.

Report of the Board of Health of the City and Port of Philadelphia to the Mayor, for 1862. Philadelphia, 1863.

Report of the Board of Health of the City and County of Sacramento, for the year ending March 31, 1862. Sacramento, 1863.

Third Annual Report of the Chicago Charitable Eye and Ear Infirmary, for the year ending May 1, 1861. Chicago, 1861.

Report on the Treatment of Acute and Chronic Diarrhœa, with the Subnitrate of Bismuth, at Camp Downey, Cal., and Finley Hospital, Washington, D. C. By John B. Trask, M. D., Act. Ass. Surg. U. S. A. San Francisco, 1863. (From the Author.)

Complete Record of the Surgery of the Battles fought near Vicksburg, December 27th, 28th, 29th, and 30th, 1862. By E. Andrews, late Surgeon of 6th Reg. Illinois Light Artillery. Chicago, 1863. (From the Author.)

Annual Statement of the Guardians for the Relief and Employment of the Poor of the City of Philadelphia, for the fiscal year ending December 31, 1862. Philadelphia, 1863. (From Dr. Butler.)

Hospital Notes and Memoranda: in illustration of the Congestive Fever (so called) or Epidemic Cerebro-Spinal Meningitis, as it occurred in the Winter and Spring of 1862–63, in the Camps in and around the Town of Newbern, with some Account of its Origin, Nature, and Treatment. By J. Baxter Upham, M. D., Surgeon in charge of Stanley General Hospital, 18th Army Corps, Dep. N. Carolina. Boston, 1863. (From the Author.)

A Brief Plea for an Ambulance System for the Army of the United States, as drawn from the extra sufferings of the late Lieut. Bowditch and a wounded comrade. By Henry I. Bowditch, M. D., Prof. Clin. Med. in Harvard College. Boston, 1863. (From the Author.)

An Apology for the Medical Profession, as a means of developing the whole Nature of Man. A Valedictory Address to the Graduating Class of Harvard University. March 11, 1863. By Henry I. Bowditch, M. D. Boston, 1863. (From the Author.)

The Sunbeam and the Spectrascope. By Howard Townsend, M.D., Prof. Phys. and Mat. Med. Albany Medical College. Albany, 1863. (From the Author.)

The following Journals have been received in exchange:—

Annales Médico-Psychologiques. Par MM. les Docteurs Baillarger et Cerise. October, 1862. January, 1863.

Gazette Médicale de Paris. Redacteur en chef, Jules Guérin, M.D.P. Nos. 3, 4, 5, 6, 8, 9. 1863.

Gazette Hebdomadaire de Médecine et de Chirurgie. Redacteur en chef, A. Dechambre. Nos. 4, 5, 6, 7, 8, 9, 10. 1863.

Revue de Thérapeutique Médico-Chirurgicale. Par A. Martin-Lauzer, M.D. Nos. 7, 9, 10. 1863.

Edinburgh Medical Journal. March, June, 1863.

British Medical Journal. May, 1863.

London Medical Review. June, 1863.

The Medical and Surgical Review (Australian). Edited by James Keene, Melbourne. March, 1863.

Canada Lancet. Edited by William Edward Bowman. March, April, May, 1863.

The Boston Medical and Surgical Journal. Edited by Samuel L. Abbot, M. D. April. May, June, 1863.

American Medical Times. April, May, June, 1863.

The Cincinnati Lancet and Observer. Edited by E. B. Stevens, M.D., and J. A. Murphy, M. D. April, May, June, 1863.

The American Journal of Insanity. Edited by the Officers of the New York State Lunatic Asylum. April, 1863.

Ohio Medical and Surgical Journal. Edited by the Professors of Starling Medical College. May, 1863.

The Chicago Medical Examiner. Edited by N. S. Davis, M. D. January, February, 1863.

The Chicago Medical Journal. Edited by Daniel Brainard, M.D., and J. Adams Allen, M. D. March, April, May, June, 1863.

Buffalo Medical and Surgical Journal. Edited by Julius F. Miner, M. D. April, May, June, 1863.

The American Journal of Ophthalmology. Edited by Julius Homberger, M. D. March, 1863.

The Sanitary Reporter. Vol. I., No. 2, Louisville. June 3, 1862.

The Medical and Surgical Reporter. Edited by S. W. Butler, M. D. May, June, 1863.

The Pacific Medical and Surgical Journal. Edited by V. J. Fourgeaud, M. D. March, April, 1863.

The San Francisco Medical Press. Edited by L. C. Lane, M. D. April, 1863.

The American Journal of Science and Art. Edited by Profs. B. SILLIMAN, B. SILLIMAN, Jr., and JAS. D. DANA. May, 1863.

The Cincinnati Medical and Surgical News. Edited by J. C. BECK, M. D. May, 1863.

American Journal of Pharmacy. Edited by WM. PROCTER, Jr., Professor of Pharmacy in the Philadelphia College of Pharmacy. May, 1863.

The American Druggists' Circular and Chemical Gazette. April, May, 1863.

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Communications intended for publication, and Books for Review, should be sent, *free of expense*, directed to ISAAC HAYS, M. D., Editor of the American Journal of the Medical Sciences, care of Messrs. Blanchard & Lea, Philadelphia. Parcels directed as above, and (carriage paid) under cover, to Messrs. Trübner & Co., Booksellers, No. 60 Paternoster Row, *London, E. C.*; or M. Hector Bossange, Lib. quai Voltaire, No. 11, *Paris*, will reach us safely and without delay. We particularly request the attention of our foreign correspondents to the above, as we are often subjected to unnecessary expense for postage and carriage.

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☞ The advertisement-sheet belongs to the business department of the Journal, and all communications for it should be made to the publishers.

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# CONTENTS

OF THE

# AMERICAN JOURNAL

OF THE

# MEDICAL SCIENCES.

NO. XCI. NEW SERIES.

JULY, 1863.

## ORIGINAL COMMUNICATIONS.

### MEMOIRS AND CASES.



### TRANSACTIONS OF SOCIETIES.

## REVIEWS.

## BIBLIOGRAPHICAL NOTICES.

# QUARTERLY SUMMARY

OF THE

# IMPROVEMENTS AND DISCOVERIES IN THE MEDICAL SCIENCES.

## FOREIGN INTELLIGENCE.

### Anatomy and Physiology.



### Materia Medica and Pharmacy.



### Medical Pathology and Therapeutics, and Practical Medicine.

### Surgical Pathology and Therapeutics, and Operative Surgery.



### Ophthalmology.



### Midwifery.



### Medical Jurisprudence and Toxicology.

## AMERICAN INTELLIGENCE.

### Original Communications.



### Domestic Summary.

THE

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# OF THE MEDICAL SCIENCES

FOR JULY 1863.

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Art. I.—*A contribution toward the Natural History of Articular Rheumatism; consisting of a report of thirteen cases treated solely with palliative measures.* By Austin Flint, M.D., Professor of the Principles and Practice of Medicine in the Bellevue Hospital Medical College, and in the Long Island College Hospital.

The natural history of a disease comprises everything relating to that disease when its course is not interrupted nor altered by any extrinsic agencies. Under favourable hygienic circumstances, what are the symptomatic events which a particular disease manifests? Of these events, which are constant, which are present more or less frequently, and, as regards the latter, what is the relative frequency of the occurrence of each? What are the laws of the development of the disease, of its progress and of the phenomena which belong to it? What is its intrinsic tendency with respect to its ending in death or recovery? What is its average duration in fatal and non-fatal cases? What appreciable changes in the solids or fluids of the body are peculiar to it? What are its sequels? The answers to these questions embrace the facts which make up the natural history of the disease.. The facts are to be obtained by observing cases in which there have been no disturbing influences including therapeutical interference. Cases treated by means of measures designed to arrest, abridge, diminish the intensity of the disease or change its character, cannot supply the data for determining accurately its natural history. The facts furnished by the observation of such cases, consist, in part, of the phenomena of the disease, and partly of the effects of treatment; and, if the natural history of the disease be not already known, it is impossible to discriminate between the former and the latter. The clinical history of a disease, if based on the observation of cases in which therapeutical agencies of more or less potency have been employed,

is by no means the natural history of that disease; the therapeutical agencies employed, in proportion to their number and potency, have affected its phenomena, laws, etc., or given rise to events which have nothing to do with the disease.

These assertions are simple truisms, and when it is added that, simple as they are, they have not been heretofore, and are not even now, sufficiently appreciated by the medical profession, it is to be considered that, in the first place, the importance of knowing the natural history of diseases has not been, and is not always duly estimated, and, in the second place, that there are difficulties in the way of obtaining the facts on which the natural history of diseases is to be based. The importance of this knowledge is very great; for, if we are unacquainted with the natural history of any particular disease, we cannot tell in individual cases, whether the course of the disease be regular or eccentric; we are liable to doubt and error in the diagnosis and prognosis; in short, we are not prepared to judge of the present condition of the patient nor to anticipate coming events. Still more, the importance of this knowledge is shown in its bearing on the acquirement of information respecting therapeutics. The evidence of the curative efficacy of remedies is obtained by a comparison of cases in which they have been employed, with cases in which the disease has been let alone. Hence, medical experience, so far as regards the treatment of a disease, can never be complete or reliable without knowing its natural history. But the difficulties of obtaining this knowledge are great. We cannot observe cases of disease without employing therapeutical measures which we have reason to believe may contribute to the safety, welfare or even comfort of the patient. The clinical observer would be justly censured were he to withhold treatment which, in his opinion, would be useful, even for so desirable an end as obtaining data for the natural history of a disease. Hence, before he can deliberately allow diseases to pursue their course, he must be persuaded that he may do so without exposing his patients to suffering or danger, which the resources of his art would enable him to diminish or arrest. The magnitude of this difficulty is obvious, yet, within the last few years, much progress has been made in acquiring knowledge of the natural history of diseases; and I believe it is but just to say that this progress has been made under a due sense of the moral responsibility of the physician to the patient. It may be safely said that the knowledge in this direction already acquired has in no small degree exerted a salutary influence on the practice of medicine.

The purpose of this paper is to make a small contribution to our knowledge of the natural history of Articular Rheumatism. I shall submit the facts derived from the observation of a limited number (13) of cases in which this disease pursued its course, no therapeutical measures being employed with a view to any curative influence. The few measures resorted to had reference solely to the alleviation of pain. It is proper to state the

circumstances which led me to the conclusion that I could enter upon such a plan of clinical observation without impropriety.

Various methods of treating articular rheumatism have been in vogue, within the period of my own professional experience. Bleeding, local and general, together with other of the so-called antiphlogistic measures, mercury carried to ptyalism, colchicum given in doses to produce free purging and vomiting, the nitrate of potass an ounce or more daily, opium in full doses, the sulphate of quinia given largely, have been successively in vogue during the last twenty-five years; the treatment which of late years and at the present moment is generally adopted, being the administration of the salts of potassa or soda in sufficient quantity to render the union alkaline. The later method is generally known as the alkaline treatment. In 1854 I was led to analyze the cases of articular rheumatism of which I had kept records. I had notes at that time of twenty-four cases only. These were analyzed with reference to the ages of the patients, the seasons when the cases occurred, the previous health, mode of attack, the parts affected in combination and succession, the occurrence of heart complications, concomitant disorders of the nervous, pulmonary, digestive and urinary systems, the duration of the disease and the treatment.[1] As regards the treatment of these cases, in two, colchicum was given freely; in two, citric acid was the only remedy used; in several, nitrate of potass was prescribed more or less freely; in two, bleeding was practised; in eight, mercury entered into the treatment; in eleven, opium was used; in three, the sulphate quinine in full doses; in two, the iodide of potassium, and in one case lemon juice in large quantity was tried. The general conclusions drawn from the analysis of these cases with reference to the treatment, are contained in the concluding remarks as follows:—

"The results developed by the analysis of the few cases contained in this collection are of importance only as a small contribution toward the accumulation of facts by which, it is to be hoped, the merits, real and relative, of the several remedies that have been noticed may be determined. As the true point of departure for studying the effects of any, or all remedies, our science lacks here, as with reference to most other diseases, knowledge of the average duration, etc., of a series of cases in which the disease was allowed to pursue its course undisturbed by medicinal interference. This knowledge cannot be voluntarily and deliberately acquired. Facts bearing thereon can only be obtained slowly as chance supplies them. And, at the present moment, we cannot answer the question; what are the intrinsic tendencies of articular rheumatism as respects its continuance, its complications and remote consequences in the organism? Were we able to answer this question by an appeal to facts, we should then have a criterion by which to estimate the favourable or unfavourable influences of different methods of treatment pursued in a series of cases; as it is, in bringing statistical information to bear on the therapeutics of the disease, we can only study the immediate apparent effects of different remedies, and institute

[1] Vide Buffalo Medical Journ., No. for March, 1854, vol. ix. p. 557.

comparisons, in this point of view, and also with reference to the duration of the disease, etc., in different series of cases treated by different methods. So far as the observations go which have been presented in this paper, they lead to a distrust of the efficacy of the several remedies employed, rather than tend to increase confidence in our ability to control by means of them the progress of the disease. Some of the remedies appear to possess more or less palliative power. This is true of colchicum, bleeding, and opium; but as respects the duration of the disease, it was in some cases short and in other cases protracted under different remedies. This being so, it is perhaps more philosophical to attribute these differences to variations in the tendencies of the disease, in different cases, rather than to the agency of the remedies used. It is to be observed that under the use of several remedies supposed to possess more or less remedial efficacy in this disease, the complication most to be apprehended, viz: heart affection, became developed. This was true of colchicum, the nitrate of potass, calomel, and opium."

These remarks were published in 1854. Since that date the alkaline treatment has been very generally adopted. The reader need not be informed that the able writings of Dr. Henry Wm. Fuller have done much to establish this method. The statistics presented by Dr. Fuller, in his work on rheumatism, and in the clinical lectures at this moment in progress of publication in the *Medical News and Library*, certainly show a striking contrast between the results of the alkaline treatment and of the various methods formerly in vogue; but they do not show the results of the alkaline treatment as compared with the natural history of the disease. During the last eight years I have been accustomed to rely on alkaline remedies in the treatment of this disease; not, however, employing them in as large doses as Dr. Fuller recommends in his recently published lectures. The preparation which I have generally selected is the tartrate of potassa and soda, given until the urine is rendered alkaline. This is the article generally used in this city. At the Bellevue Hospital the standing remedy for rheumatism is a solution of the tartrate of potassa and soda with a small proportion of colchicum, known in the hospital as the anti-rheumatic mixture; and during my eight months' service in 1861–62 this mixture was employed in the cases of rheumatism admitted into my wards. I have not taken pains to keep records of the cases which I have observed during the last few years; but the impression which has been left upon my mind is, that, as regards the severity of the disease, its duration, and the liability to cardiac complications, the alkaline treatment, in my hands, has given results not materially different from those afforded by the methods of treatment previously in vogue. This is my impression; I will not say conviction, for I freely admit that I have not the data, derived from my own clinical experience, for forming a positive conclusion. Nor shall I argue in behalf of the probable correctness of this impression; my object in stating it being simply to show how I came to consider it appropriate to begin to observe cases of this disease in which no measures were employed with reference to a curative effect.

On entering on duty at Bellevue Hospital in August, 1862, I resolved to treat with palliative measures only the cases of articular rheumatism which should be received into my wards, so long as circumstances might lead me to conclude that, by continuing this plan, no injustice was done to the patients, whose relief was, of course, paramount to any other object. The cases thus treated progressed so satisfactorily that I found no ground for a discontinuance of the plan. The last case which came under my observation, in fact, was the only one in which any important complication occurred. Some of the cases were recorded by myself, and the remainder by my zealous clinical assistant, Dr. Shiverick. I shall proceed to submit a condensed report of all in which there had been no treatment of importance prior to admission into hospital, or before the cases came under my observation, as well as during the time they were under my charge. A few cases had been already under treatment, and I had not, therefore, the opportunity of carrying out my plan fully from the start. These cases are not included in the series now to be reported, and, in addition, one case in which the anti-rheumatic mixture of the hospital was given for several days in consequence of a misapprehension. The reported cases were treated throughout the whole course of the disease with only palliative measures. These measures, as will be seen, consisted of opium in some form, given in small or moderate doses, the application generally of dry flannel to the affected joints, and the use of either the soap and opium liniment, camphorated oil, or the tincture of aconite. But to secure the moral effect of a remedy given specially for the disease, the patients were placed on the use of a placebo which consisted, in nearly all of the cases, of the tincture of quassia, very largely diluted. This was given regularly, and became well known in my wards as the *placeboic remedy* for rheumatism. The favourable progress of the cases was such as to secure for the remedy generally the entire confidence of the patients. I may add that all the cases were brought before the medical class in attendance during the winter.

CASE 1. *Acute Rheumatism. Endocardial Murmur at the Base and Apex.*—Ann Malloy, aged 35, domestic, admitted Aug. 13, 1862. Had never before had rheumatism, and always enjoyed good health. On the 5th inst. the left wrist became painful, tender, and swollen; the next day the right wrist was similarly affected. Both wrists were still swelled, painful, hot, and tender. The left ankle and right elbow had also become affected; other joints not affected. Had kept the bed since the date of the attack. Moderate febrile movement. No treatment prior to admission.

In this case the *placeboic* remedy employed was a very weak solution of the sulphate of quinia, the patient not getting more than two grains in the twenty-four hours. A little opium was given at night. A lotion of lead and opium was applied to the affected joints, and the latter covered with oiled muslin.

When this case first came under observation, a soft systolic murmur existed at the apex, over the body, and at the base of the heart. The heart was not enlarged, and no pain or tenderness was referable to the præcordia.

*August* 19. The patient's condition remains about the same. No affection of other joints than those at first affected. Pulse 92.

23*d*. She reported, and was evidently better. No new joints had become affected; the affected joints less painful. Pulse 84. Some appetite.

The bowels were moved on the 21st with a saline laxative, there having been no dejection for several days. Dry flannel had been substituted for the lead and opium wash.

26*th*. No new joints affected; appetite fair, and she was allowed full diet. Pulse 75. She still kept the bed. Camphorated oil was applied to the affected joints.

28*th*. Convalescing and sitting up. Good appetite and no restriction of diet. The anodyne at night had been discontinued.

*September* 4. Had continued to improve. A soft, feeble murmur heard at the base and over the body of the heart, but not at the apex.

8*th*. The patient was discharged at her own request. No cardiac murmur was discoverable by Dr. Shiverick and myself.

21*st*. This patient called at the hospital, and reported that she continued free from rheumatism; she complained of weakness, and presented a pallid aspect.

*Remarks.*—The duration from the date of attack to convalescence was 23 days; the time in hospital was 26 days; the duration of convalescence was about 11 days. The joints affected were both wrists, one ankle, and one elbow. An endocardial murmur existed and disappeared during convalescence.

CASE 2. *Subacute Rheumatism. Endocardial Murmur at the Apex.*—Mary S. Watson, domestic, admitted August 20, 1862. The patient stated that her health had been good up to three weeks prior to her admission, when, after some exposure, she had pain in the back, not very severe, for which a sinapism was applied. She was next seized with pain in the left hip, and subsequently the left wrist and right knee had been affected. These joints were still affected, but in a moderate degree. She keeps the bed, not from necessity, but because she was more comfortable than when sitting up. She had had no medical treatment.

She was placed on the tincture of quassia largely diluted. Dry flannel to the affected joints.

*August* 24. Up and dressed. She complained of pain and soreness in the left ankle, right knee, and both shoulders. Pulse 72. Appetite good.

26*th*. Kept the bed, and complained of pain in the right knee, in both hips, and in both shoulders. The right knee was tender, and there was some effusion into the joint. Pulse 68. The appetite was tolerable, and she was allowed full diet. Bowels constipated.

A soft, feeble, systolic murmur was heard at the apex. The sounds of the heart were feeble, especially the first sound. The heart was not enlarged.

28*th*. Patient up and reported better. No new joints affected.

*September* 2. The patient left the hospital, reporting herself quite well. It is not noted whether or not the endocardial murmur existed at the time of her discharge from the hospital.

*Remarks.*—The duration from the date of the attack to convalescence was about twenty-eight days. The time in hospital was twelve days. The

duration of convalescence was five days. The joints affected were both hips, one wrist, one knee, and both shoulders.

CASE 3. *Acute Rheumatism. Murmur in the Pulmonary Artery.*—Margaret Evans, age 26, domestic, admitted August 29, 1862. A week before her admission the phalango-metacarpal joint of the left thumb became swelled, reddened, and painful. She poulticed it for three days. At the end of three days the right knee became affected. No other joints were affected prior to her admission, but directly afterward the right elbow became affected, the joints previously affected remaining so. She had had no medical treatment, excepting that she had taken a dose of castor oil. She was suffering much from the affected joints. She perspired occasionally. Pulse 80.

A faint, systolic, bellows murmur was appreciable at the base of the heart over the pulmonary artery.

The *placeboic* remedy was prescribed with an anodyne at night, and, for the affected joints, dry flannel and the soap liniment.

*September* 4. The affected joints were still quite painful, but no other joints affected. Pulse 94. Bowels constipated. The pulmonic murmur was still heard, and no murmur elsewhere. She had some appetite, and full diet was allowed.

*6th.* Some improvement. Pulse 80. No other joints affected.

*9th.* Much improvement; the patient sitting up.

*15th.* Patient up and about the ward.

*October* 6. The patient had progressively improved, and was discharged well on this date.

*Remarks.*—The duration from the date of the attack to convalescence was about seventeen days. The whole time in hospital was thirty-seven days; time after convalescence twenty-seven days. The elbow, knee, and phalango-metacarpal joint of the thumb were the only joints affected. It is not noted whether or not the basic murmur existed at the time of her discharge.

CASE 4. *Acute Rheumatism. Endocardial Murmur.*—Margaret Kelly, age 19, seamstress, admitted September 2, 1863. Two months before her admission she had intermittent (tertian) fever, which continued for a month. Had not recovered her former strength, when, on the 31st ult., she was attacked with pain and soreness in both knees, both ankles, and the right wrist. These joints only were affected on her admission. She had kept the bed since the 31st ult., and had had no medical treatment. The affected joints were painful, tender, swollen, and the ankle and knee-joints presented circumscribed erythema. The pulse was frequent, numbering on the day of admission 120. She perspired freely during the night. A faint, systolic murmur existed at the base of the heart.

The *placeboic* remedy was prescribed, and dry flannel to the affected joints.

*September* 4. The pain, etc., in the affected joints was diminished, and no other joints had become affected. Pulse 104. Perspiration continued. The murmur at the base of the heart continued, and was heard over the body of the heart, but not at the apex. At the base it was loudest over the pulmonary artery.

*8th.* Improvement continued, but the affected joints were still tender

and painful. No other joints affected. Pulse 100. Some appetite. A little morphia at night was prescribed. Prior to this date no anodyne had been given.

*11th.* Much better; the patient set up for a short time on the preceding day. Pulse 78. Perspiration had ceased.

*13th.* No tenderness in any of the affected joints, and the patient quite well.

*24th.* Patient left the hospital well. The endocardial murmur was faintly perceived.

*Remarks.*—The duration from the date of attack to the time of convalescence was about twelve days. Time in hospital twenty-two days. Both knees, both ankles, and one wrist only affected; and no joint affected after admission. Time in hospital after convalescence, fifteen days.

CASE 5. *Acute Rheumatism shortly before Admission. Relapse after Admission. The Affection Subacute.*—Anna Gross, aged 25, domestic, admitted August 25, 1862. This patient stated that two months previously she was attacked with rheumatism; that most of the joints were affected, and that she was confined to the bed for two weeks. She had had some remedies, but she was not able to state what they were. On her admission she was free from rheumatism, but complained of pain in the upper part of the chest, on the right side. On September 1st the left wrist-joint and right knee became swelled, tender, painful, and reddened. She complained also of pain and soreness in the right shoulder. Prior to the development of the rheumatism in hospital she was taking the sulphate of quinine. When the rheumatism occurred this was discontinued, and the *placeboic* remedy substituted; the affected joints were covered with flannel, and the soap and opium liniment applied to them.

*September* 4. The pain, etc., in the affected joints had diminished. No other joints had become affected. Pulse 84. No cardiac murmur. Some appetite.

*8th.* No other joints affected. The affected joints improving.

*13th.* The patient was up and about the ward. She was free from rheumatism, excepting that the dorsal surface of the left hand was swelled and painful.

*16th.* Patient left the hospital, some swelling and soreness of the dorsal surface of the left hand remaining, but otherwise quite well.

*Remarks.*—The duration from the relapsing attack in hospital to convalescence was thirteen days. Time in hospital twenty-two days. Time in hospital after convalescence three days. The joints affected were the left wrist and the right knee.

CASE 6. *Acute Rheumatism. Bellows Murmur at the Base of the Heart.*—Mary Hickey, aged 32, domestic, admitted August 27, 1862. She was attacked with pain, etc., on the day before her admission, in the right wrist; and, on the day of her admission, in the right knee-joint. These joints, when she was admitted, were tender, swollen, and presented an erythematous flush. No other joints were affected. The pulse was 116. No cardiac murmur was discoverable. She had never had rheumatism before, and she had had no medical treatment.

The *placeboic* remedy was prescribed, with flannel to the affected joints, and an anodyne at night.

*August* 30. The patient reported better. No new affection of joints. No cardiac murmur. She complained still considerably of the affected joints. Pulse 108. She had some appetite, and no restrictions were imposed as regards diet.

*September* 2. The patient still complained of the affected joints. No other joints affected. Pulse 96. Bowels constipated. Having learned that the patient was addicted to drinking gin, a little whiskey was allowed. The soap liniment was applied to the affected joints.

*4th*. The condition was about the same. No new affection of joints. Pulse 100. A feeble, systolic murmur was heard at the base of the heart; more marked over the pulmonary artery than over the aorta.

*8th*. Reported better. The affected joints were less painful, and no new joints affected.

11*th*. No material alteration.

15*th*. Much improved. Pulse 80.

20*th*. The improvement continued.

25*th*. The patient was up and about the ward.

*October* 7. The patient was quite well.

15*th*. She was discharged.

*Remarks*.—The duration from the date of the attack to convalescence was above twenty-six days. The time in hospital was forty-nine days. It is not noted whether or not the bellows murmur existed at the time of her discharge. Time in hospital after convalescence twenty-four days. The joints affected were the right wrist and the right knee.

CASE 7. *Acute Rheumatism. Aortic and Mitral Murmur*.—Catherine Shay, aged 25, domestic, admitted Oct. 15, 1862. About a month prior to her admission, the left-knee joint was painful, reddened, and swollen. At the same time the dorsal surface of the left hand was painful, reddened, and swollen. In about a week she had apparently recovered; but shortly the right knee-joint was attacked; she was obliged to take to the bed, and had remained in bed up to her admission, a period of two weeks. On her admission, the knee only was affected; she had taken some remedies before coming to the hospital, but did not know what they were. Pulse 106.

She had an aortic direct and a mitral systolic bellows murmur. The heart was not enlarged.

The *placeboic* remedy was prescribed, with an anodyne at night, and the affected joint was wrapped in dry flannel.

19*th*. The affected knee-joint remained about the same. The right ankle-joint became affected on this date. The tincture of aconite was applied to the affected joints with marked relief.

22*d*. The condition was about the same. A cathartic had been administered, the bowels having been constipated.

24*th*. Much improved. The knee-joint was now the only one affected, and the swelling, tenderness, and pain in this joint were much diminished. Pulse 96.

*Nov*. 4. Improvement had continued, and the patient was able to sit up; the cardiac murmur remained.

25*th*. Left the hospital, complaining of a little stiffness in the affected knee.

*Remarks.*—The duration from the date of attack to convalescence was about 30 days; time in hospital 40 days. In this case one joint only, the ankle, became affected after the admission into hospital, the knee-joint only having been affected prior to her admission. Time in hospital after convalescence, 31 days.

CASE 8. *Acute Rheumatism. Bellows Murmur at Base of Heart.*—Emma Stewart, age 20, domestic, admitted Oct. 15, 1862. The patient stated that about a month before her admission the right shoulder became painful and tender to the touch, and a week later the left shoulder became affected in the same way. A few days afterward, the right and left ankles became painful, tender, and swollen; and in a few days more the right elbow was affected. These joints remained affected. She had kept the bed part of the day for two weeks, and, within a few days, constantly. She had had no medical treatment. The day after her admission, the joints of two of the fingers of the right hand became affected.

A systolic bellows murmur existed at the base of the heart over the pulmonary artery. The heart was not enlarged.

17*th*. The left elbow became affected. The *placeboic* remedy was prescribed; the affected joints wrapped in flannel, the tincture of aconite applied, and an anodyne given at night.

20*th*. The patient was much better. The febrile movement, which previously existed, had subsided, the pulse now being 88. A laxative was prescribed, no dejection having occurred for several days.

26*th*. The sterno-clavicular articulation had become tender and painful. The affection of the joints, previously attacked, was much diminished.

29*th*. Improvement continued.

*Nov.* 4. The patient was sitting up. The affection of the joints had nearly disappeared.

21*st*. The patient was quite well. The date of her discharge is not noted.

*Remarks.*—The duration from the date of attack to convalescence was about 45 days. The duration from her admission to complete recovery was about 35 days. The duration after convalescence to complete recovery was 21 days. The finger joints of one hand, one elbow joint, and the sterno-clavicular articulation on one side became affected after admission; both shoulders, both ankles, and the right elbow having been affected prior to admission. It is not noted whether or not the bellows murmur at the base of the heart existed after recovery.

CASE 9. *Acute Rheumatism. Bellows Murmur at the Base of the Heart.*—Anna Irwin, aged 23, domestic, admitted October 23, 1862. She was attacked during the night of the 21st instant with pain, followed by swelling and tenderness, in the right knee-joint. No other joint had become affected. She had kept her bed since the attack. She had perspired freely, especially during the night. On her admission the knee-joint was considerably swollen, painful, and presented an erythematous flush. A bellows murmur existed at the base of the heart, over the acute and pulmonary artery. The pulse was 90.

The *placeboic* remedy was prescribed, with the tincture of aconite to the affected joint, which was enveloped in flannel.

*October* 26. No other joint affected. The knee was less painful, and the swelling diminished. Pulse 105. No dejection having occurred for several days, a dose of castor oil was prescribed.

29*th*. The patient much improved, and no other joint affected.

*November* 4. No other joint affected. The knee was still painful. The bellows murmur continued.

11*th*. The patient still kept the bed, but no other joint affected.

21*st*. The patient complained only of stiffness in the affected knee-joint.

*December* 12. Left the hospital quite well.

*Remarks.*—The duration from the date of attack to convalescence was about twenty-five days. Time in hospital was fifty days. Time in hospital after convalescence twenty-four days. No joint became affected after admission, and the knee-joint was alone affected during the continuance of the disease. It is not noted whether or not the bellows murmur existed at the time of her discharge.

CASE 10. *Acute Rheumatism. Bellows Murmur at the Base of the Heart.*—Roderick Knox, aged 42, admitted December 30, 1862. The patient stated that he had rheumatism for the first time fifteen years before, and he had had the disease repeatedly since. The present attack occurred five weeks before his admission. Different joints had been successively affected, as follows: The right and left knee, the left and right ankle, and the left elbow. After his admission the left wrist became affected. He had had no medical treatment prior to his admission.

This patient, through a mistake, got the anti-rheumatic mixture of the hospital for two or three days. The *placeboic* treatment was then substituted.

*January* 8. No improvement. The small joints of the hands and feet have become affected. He kept the bed. Pulse 96.

13*th*. The patient complained of much pain in the affected joints. The existence of a systolic bellows murmur is noted. The tincture of aconite and flannel were directed for the affected joints, and the sulphate of morphia *pro re nata*.

22*d*. The patient was much improved. He was now sitting up, but unable to walk on account of tenderness of the ankle joints.

25*th*. The improvement continued. He complained only of tenderness of the ankle joints.

29*th*. Improvement continued. The cardiac murmur still existed. The murmur was limited to the base of the heart, over the pulmonary artery.

*February* 1. On this date I left the division. Under date of Feb. 24 it is noted that the patient left the hospital shortly prior to that date, but had been readmitted in consequence of a return of the rheumatism.

*Remarks.*—The duration from the date of the attack to convalescence was about fifty-six days. Duration after admission to convalescence about twenty-two days. The small joints of the fingers and toes became affected after his admission; both knees, both ankles, one elbow, and one wrist having been affected prior to admission.

CASE 11. *Acute Rheumatism. The Patient affected with Pulmonary Tuberculosis Non-Progressive.*—A. Crawford, cartman, age 54, admitted January 14, 1863. The patient stated that he had had rheumatism in July, 1862, lasting about six weeks. A week prior to his admission the right knee-joint became painful, tender, and swollen. The affection of this joint continued on his admission, and no other joint had become affected. The pulse was 96. He had no medical treatment prior to his admission.

The *placeboic* remedy was prescribed.

*January* 18. The affection of the knee continued, and he complained much of pain in this joint. No other joint affected.

*22d.* He remained about the same.

*25th.* The affection of the right knee continued, and he complained of pain in the left knee; but the latter was not swollen nor reddened. He also complained of pain in the right shoulder.

*30th.* The knee first affected was nearly free from pain, etc. The left knee was moderately affected. He complained of pain in the right shoulder and left foot.

This patient had made no complaint of any pulmonary symptoms, and I was led to auscultate the chest in order to obtain a good example of the normal murmur for class illustration. To my surprise I found bronchial respiration at the left summit, with dulness on percussion. I then ascertained that cough had existed since the preceding August. His aspect denoted health, and he did not think his cough of sufficient consequence to call attention to it.

*February* 1. I left the division on this date. The patient could be considered as convalescing. I subsequently ascertained that he continued to convalesce, and shortly afterward left the hospital.

*Remarks.*—The left knee, right shoulder, and left foot became affected after his admission. The affection of these joints, however, was slight; one knee only was affected prior to his admission. The duration from the date of attack to convalescence was about twenty-four days. Duration from admission to convalescence was about seventeen days. The absence of cardiac murmur is not noted; but all cases were examined repeatedly with reference to this point, and had a murmur existed it would doubtless have been noted.

CASE 12. *Acute Rheumatism. Bellows Murmur in the Aorta and Pulmonary Artery.*—Ann Burke, age 35, domestic, admitted January 31, 1863. She had rheumatism a year before the present attack, and was confined to the bed for six weeks. She recovered fully and remained well until three days before her admission. The right ankle was first affected, then the left, and obliged her to take to the bed. These joints were swollen, tender and painful on her admission. Pulse 90. Had had no medical treatment.

The *placeboic* remedy was prescribed, with an anodyne at night and the tincture of aconite to the affected joints.

*February* 6. The patient reported much better. No other joints affected. A faint bellows murmur existed at the base; and I judged from the difference in pitch of the murmur on the right and left sides of the sternum, that there were in fact two murmurs, one in the aorta and the other in the pulmonary artery. No murmur over the body of the heart or at the apex.

12*th*. No other joints had become affected, and the affection of the ankle-joints had so far disappeared that the patient was able to walk about without inconvenience.

14*th*. The patient was discharged quite well.

*Remarks*.—The duration from the date of the attack to convalescence was about twelve days. Time in hospital, fourteen days. No joints became affected after admission; both ankles being the only joints affected prior to admission. It is not noted whether or not the bellows murmur at the base of the heart existed at the time of her discharge.

CASE 13. *Acute Rheumatism, Endocarditis, Pericarditis, and Pneumonia developed. The latter affections treated with alcoholic stimulants, carbonate of ammonia and the chlorate of potassa in large doses. Recovery.*—Delia McNeil, age 20, domestic, admitted March 5, 1863. The patient stated that her health had been good excepting within the last two years. She had had during this period intermitting fever repeatedly. She was attacked four weeks before her admission with pain and tenderness in the left knee-joint and afterward in the right knee, the left ankle, the right ankle, in both shoulders, both wrists, and the left hip-joint. These joints were all more or less affected on her admission—the knees, ankles, and wrist-joints being swollen and reddened. She had kept the bed for thirteen days. During this time she had anorexia, thirst, frequent perspirations and the pain prevented her from obtaining much sleep. For three or four days prior to her admission she had had pain in the præcordia, for which a sinapism had been applied. Aside from this she had had no medical treatment. The pulse was 120.

A systolic murmur existed at the apex, propagated for some distance without the apex and indistinctly heard over the body of the heart. A murmur existed at the base over the pulmonary artery, and not over the aorta. There was moderate tenderness over the præcordia.

The *placeboic* remedy was prescribed, with the tincture of aconite over the affected joints, and Dover's power at night.

*March* 7. On this date there was present a well-marked pericardial friction murmur, with the symptoms of acute pericarditis. This sign and the symptoms of pericarditis were not present on the previous day. The friction murmur had its maximum over the sternum on a level with the nipple; it extended over the præcordia but not without it; it was double and intensified notably by pressure with the stethoscope. A feeble cardiac impulse was felt in the fourth intercostal space between the nipple and sternum. Marked dulness on percussion existed within a line on the left side, extending from the second rib on the median line half an inch without the *linea mammalis* in the left side, and, on the right side, half an inch without the right margin of the sternum. The pulse was 120, of fair volume and strength. The respirations were 66. There was sharp pain in the præcordia on deep inspiration.

Four ounces of whiskey daily were directed, and opium in sufficient doses to procure relief. Oiled muslin was applied over the præcordia.

8*th*. The patient was more comfortable. The pulse was 116, soft and feeble; the respirations were 48; she perspired freely; the ankle and knee-joints and the left wrist-joint were painful and tender. The friction murmur was louder than on the previous day; the limits of dulness on percussion were somewhat extended. The treatment was continued.

*9th.* Pulse was 112; respirations were 35; continued to perspire freely; The dulness in præcordia did not extend over a wider space than on the previous day. Treatment continued.

*10th.* Pulse 100, with more volume and force; respirations 32; the friction sound less intense. Treatment continued.

*11th.* The patient reported having suffered much from pain in the præcordia, which was quite tender on pressure. Pulse 104; respirations 36. A dejection to day, and not previously for several days. She perspired freely. The affected joints were tender but not painful. The friction-murmur continued. The mitral systolic bellows murmur was faintly heard. Treatment continued.

*12th.* The patient complained of præcordial pains. Pulse 120; the friction-murmur continued. No evidence of an increase of the pericardial effusion. A poultice to the præcordia was directed, the opium to be increased and the whiskey continued.

*14th.* No alteration in this case was noted until on this date, when she became much worse. The pulse became extremely rapid and feeble; she was greatly prostrated, and seemed almost moribund; she complained of severe pain in the chest. This unfavourable change followed suspension of the whiskey, which was done at the patient's desire as preparatory for the rite of communion. The whiskey was resumed and given more freely, six ounces being taken in five consecutive hours. A grain of opium was given hourly. Under this course of treatment she was measurably relieved, and the symptoms were improved.

*15th.* The examinations of the chest for several preceding days had been limited to the præcordia. On this date, the examination being extended, revealed the signs of pneumonia affecting the lower lobe of the left lung. Marked dulness on percussion, and the bronchial respiration existed over this lobe. The symptoms again, on this date, denoted impending dissolution. The lips were livid and the face had a dusky hue; the pulse was 128; the respirations were 60. Some tracheal rales were heard at a distance. I regarded the prognosis as unfavourable as possible. My directions were simply to sustain the patient vigorously. The details of the treatment were left to the house physician of my division, Dr. W. M. James. The measures pursued from this date until marked improvement took place, were prescribed by him and carried out under his attentive direction. I am also indebted for the subsequent history to the copious notes made daily by Dr. James, or by the senior assistant on the division, Dr. J. C. Stone.

On the afternoon of this date (15) the hypodermic injection of ten drops of Magendie's solution was employed; half an ounce of whiskey was given every twenty minutes, and five grains of the carbonate of ammonia every fifteen minutes. In the evening thirty grains of the chlorate of potassa and a grain of opium were given hourly. At $11\frac{1}{2}$ P. M. the appearance of the surface had improved. The skin was warm and dry; the pulse was 122, with considerable volume and force; the respirations were 60.

*16th*, 1 A. M. Pulse 120; respirations 60; free perspiration. $2\frac{1}{2}$ A. M. Sleeping; pulse 120; respirations 34. *Since 9 P. M. she had taken half an ounce of whiskey, five grains of the carbonate of ammonia and fifteen grains of the chlorate of potassa every half hour, with occasionally a few drops of Magendie's solution.* From 6 A. M. to 9 A. M. the whiskey and all medicine were suspended. At 9 A. M. the lips were livid, the face was dusky, the pulse 130, and the respirations 55. She was then ordered carbonate of ammoniæ gr. xx; whiskey ℥ss; and chlorate of potassa

gr. xv, every half hour. At 11 A.M. the countenance was less dusky, the lividity of the lips was gone, the respirations were 45, and the pulse was 120. At 7 P. M. the pulse was 120, and the respirations were 44. The whiskey was increased to ʒvi every half hour. At 9 the pulse was 130 and the respirations were 54. The whiskey was increased to ʒx every half hour. At 12, midnight, the pulse was 120 and the respirations were 42. The skin was moist and the colour of the face normal. The stomach being irritable, the carbonate of ammonia was reduced to gr. x given hourly by enema. The chlorate of potassa gr. xv hourly was continued.

17*th*. The pulse at different periods of the day varied from 120 to 130; the respirations from 44 to 60. The countenance was natural, and she perspired freely. Several watery dejections occurred, which were checked by an enema of starch and laudanum. Bronchial breathing continued over the lower lobe of the left lung. At 6 P. M. the patient had taken during the preceding twenty-four hours: Whiskey ℥xxiv; carbonate of ammonia ℈iv; chlorate of potassa ℥ss; also, strong beef-tea Oj, eggs 4, and milk Oj.

18*th*. The pulse varied from 120 to 132; the respirations from 40 to 60. The skin was moist. During the twenty-four hours there were given: Whiskey ℥l; carbonate of ammonia gr. lxxx; chlorate of potassa ℥ss, and opium gr. 1 every four hours; also, beef-tea Oj, eggs 4, and milk Oj.

19*th*. The pulse varied from 120 to 128; the respirations from 54 to 60. The pulse had considerable volume and force. Countenance and skin normal; she vomited several times a greenish liquid containing mucus. During the twenty-four hours there were given: Whiskey ℥xxxviij; also, eggs 4, beef-tea Oj, milk Oij. The ammonia and chlorate of potassa were discontinued at the instance of Dr. Flint.

20*th*. The pulse varied from 120 to 130; respirations from 40 to 52. Diarrhœa occurred, and was arrested by an enema of starch and laudanum. Vomiting of greenish liquid and mucus also occurred. She drank freely of the effervescing mixture, and took of Magendie's solution ten drops. During the twenty-four hours, there were given: Whiskey ℥xvj; also beef-tea Oj, eggs 4, and milk Oj.

21*st*. The pulse 120; respirations varied from 44 to 56. The whiskey and nourishment the same as on the preceding day.

22*d*. Pulse 120; respirations 50. General improvement from day to day was manifest. The whiskey and nourishment the same as on the preceding day.

25*th*. Pulse 120; respirations 42. The whiskey was diminished to ℥j every three hours. The bicarbonate of soda gr. v every two hours, was prescribed, and Tulley's powder of opium *pro re nata*.

The pericardial friction-murmur was still heard, and the respiration was still bronchial over a part of the lower lobe of the left lung.

27*th*. Pulse 132; respiration 42. She complained of pain and soreness in several joints. She took whiskey ℥viij in the twenty-four hours.

31*st*. Under this date the following note was made by myself: "This patient has progressively improved. The respiration has become vesicular over the whole of the lower lobe of the left lung. The apex-beat is feebly felt in the fifth intercostal space. The friction-murmur has disappeared. The mitral systolic bellows murmur continues." I did not note the pulse and respirations, but the patient was distinctly convalescent on this date,[1] which terminated my period of service.

[1] May 11. This patient has continued to convalesce, and is now quite well.

*Remarks.*—I have given a condensed account of the history of this case from day to day after the development of pericarditis and pneumonia up to the time when the improvement was fairly under way, with reference to the treatment which was pursued. The treatment was determined by the existence of the affections just named, without regard to the fact that these affections were developed in the course of rheumatism. The whiskey and nourishment were given to support the powers of life, or, in other words, to obviate the tendency to death by asthenia. The chlorate of potassa was given under the idea of introducing by this remedy oxygen into the system, and was directed to the danger from apnœa, and the carbonate of ammonia was given with a view of preventing the coagulation of fibrin in the heart-cavities. These measures were employed by Dr. James at a time when I considered the case as desperate. The quantities given of each were very large. The lividity disappeared in a short time under their use. They were all suspended for several hours on one day for the purpose of observing the condition of the patient without them, and the symptoms became distinctly worse. The ammonia and chlorate of potassa were continued for several days, but at length appeared to occasion vomiting and diarrhœa, and they were in consequence withdrawn. How far the measures employed contributed, severally or collectively, to the favourable issue of the case, I leave, without discussion, for the judgment of the reader. But I cannot close these remarks without expressing my admiration of the zeal and fidelity of Dr. James and his assistant Dr. Stone, who observed and noted the symptoms of the case at intervals of a few hours during night and day, until the period of extreme danger was passed. That the patient would have died without this assiduity cannot of course be proven; but I think the reader will agree with me in thinking it highly probable that her life was saved by their exertions. Whether the success would have been secured by the alcoholic stimulus and nutriment without the ammonia and chlorate of potassa, is a question which I do not feel prepared to answer, but I cannot avoid the conjecture that the latter might have been dispensed with.

I have entitled this paper "A Contribution toward the Natural History of Rheumatism." I have not intended, by reporting these thirteen cases, to furnish data for determining the symptomatology of the disease. The cases are not only too few for this, but they were not recorded with sufficient completeness as regards the symptoms, and, in reporting them, I have condensed the records within narrow limits. My object is to analyze the cases with reference only to the following points pertaining to the natural history: The duration of the disease, and of convalescence; the number of joints affected, and the occurrence of affections of the heart or other complications. I shall proceed to consider the facts under these three heads. It will be observed that, of the thirteen cases in all but two the disease was acute; that is, the local phenomena denoted more than a slight

arthritic inflammation, and the febrile movement was more or less marked. In two cases the disease was sub-acute.

*Duration of the Disease and of Convalescence.*—The duration of the disease from the date of the attack to convalescence (excluding the case complicated with pericarditis and pneumonia), varied between twelve and fifty-six days. The duration was under fifteen days in three cases; over fifteen and under twenty days in one case; over twenty and not over twenty-five days in three cases; over twenty-five and not over thirty days in three cases; and in the remaining two cases, the duration was in one case forty-five, and in the other case fifty-six days. The mean duration was a small fraction under twenty-six days.

The duration from convalescence to the date of discharge, or complete recovery, varied from five to twenty-seven days. The mean duration was a fraction over sixteen days.

The time in hospital varied from twelve to fifty days, the mean being a fraction over thirty days.

These results go to show considerable diversity as regards the intrinsic tendency of this disease to end after a certain period. They show, however, that the disease does end from self-limitation after a duration varying in different cases. They go to show, also, that the mean duration, without curative treatment, cannot greatly exceed the average length of the disease when active measures are employed with a view of controlling it. These conclusions are admissible as deductions from the analysis of the small number of cases reported in this article; but, of course, a much larger collection of cases is desirable in order to determine fully the laws of the disease with respect to duration. As remarked by Valleix, this is one of the most important of the points belonging to the clinical study of this disease; for, since the disease is generally unattended by any immediate danger to life, the chief object of treatment, aside from the prevention of grave complications, is to abridge its duration. And as a standard for determining, by comparison, whether measures employed to cure the disease do exert a curative effect, its natural history, as regards the laws of its self-limitation, must be ascertained.

In my former report I gave the results of an analysis of seventeen cases, with reference to the duration from the date of attack to convalescence. The average duration in these cases was less than that of the cases in the present collection, being a fraction over seventeen days. Of the seventeen cases, in four convalescence occurred under twelve days. These cases were treated actively by different measures. It is fair to suspect that in some of these cases the disease was abridged; but it may, with equal fairness, be suspected that in a certain proportion, and perhaps the larger proportion of cases, whatever be the treatment pursued, this disease obeys its own laws as respects continuance.

*The Number of Joints affected.*—The following is a recapitulation of the joints affected in each of the cases:—

Case 1. Both wrists, one ankle, and one elbow.
" 2. Both hips, one wrist, one knee, and both shoulders.
" 3. One knee, one elbow, and phalango-metacarpal joint of thumb.
" 4. Both knees, both ankles, and one wrist.
" 5. One wrist and one knee.
" 6. One wrist and one knee.
" 7. One knee and one ankle.
" 8. Both shoulders, both ankles, both elbows, the finger joints of one hand, and the sterno-clavicular articulation on one side.

Case 9. One knee only.
" 10. Both knees, both ankles, one elbow, one wrist, and the small joints of fingers and toes.

Case 11. Both knees, one shoulder, and one ankle.
" 12. Both ankles.
" 13. Both knees, both ankles, both shoulders, both wrists, and one hip.

The important topics of inquiry under this head are, *first*, Are a greater number of joints affected; and, *second*, Is the affection of the joints of greater intensity, when only palliative measures are employed, than when the disease is treated by measures supposed to be curative?

With respect to the first of these topics, an examination of the foregoing recapitulation will, I think, satisfy the reader who has had much practical acquaintance with articular rheumatism, that these cases will compare favourably with cases as they ordinarily occur in practice when treated by the different methods which have been in vogue. As regards the second topic, I can only give the impression left upon my mind after the observation of these cases; and my impression is, that the average intensity of the affection was not greater than a practical acquaintance with the disease would lead us to expect in the same number of cases treated with active remedies.

*Affections of the Heart and other Complications.*—I come now to the most important of the subjects belonging to the clinical study of articular rheumatism. This disease involves immediate danger to life only when pericarditis or some other grave complication becomes developed. The occurrence of endocarditis, which modern researches have shown to be a frequent complication, although it does not place life in immediate jeopardy, renders the patient liable, at a period more or less remote, to serious organic lesions of the heart. Clinical observation shows that, of persons affected with valvular lesions a very large proportion have been affected with articular rheumatism. Hence the complications of this disease, and especially those of the heart, are the events to be most dreaded. So far as regards treatment, measures on which reliance might be placed to prevent the occurrence of pericarditis and endocarditis are much more to be desired

than measures to abridge the duration of the disease, to limit the number of joints affected, to diminish the intensity of the arthritic inflammation, or to relieve the sufferings of the patient. With a full appreciation, then, of the importance of this point of inquiry, I proceed to review the cases which I have reported, with reference to cardiac complications.

An endocardial or bellows murmur existed in eleven of the thirteen cases. Was endocarditis developed in this large proportion of cases? I do not hesitate to answer this question negatively. The murmur was limited to the base of the heart in all but three cases; it was limited to the site of the pulmonary artery in two cases. I have for some time ceased to regard a murmur over the aorta or pulmonary artery as evidence of endocarditis in rheumatism. I suspect such a murmur will be found in the majority of cases, especially in females, if a careful examination be made with Cammann's stethoscope. It is to be remarked that, of the thirteen cases, all but two were females. I have also been led to doubt whether a murmur at the apex and over the body of the heart, developed in the course of rheumatism, is to be regarded as, in itself, sufficient evidence of endocarditis.[1] A murmur in these situations may be developed and disappear during convalescence; this was observed in one of the three cases in which a murmur existed at the apex. There is reason to believe that murmurs here, as well as at the base, may be of hæmic origin. To be evidence of endocarditis, a murmur must be mitral, developed under observation, persisting, and having a certain degree of intensity, and it should be associated with some symptoms denoting a cardiac affection; viz., pain or uneasiness in the præcordia, tenderness, and greater disturbance of the heart's action than is consistent with the febrile movement belonging to the rheumatic affection. With these views I did not consider that there were adequate grounds for the diagnosis of endocarditis, save in one case, in which pericarditis also existed (Case 13). Of the correctness of this judgment the reader will, of course, form his own opinion. It is an open question, and one difficult to settle, as to the source and significance of a mitral or intra-ventricular murmur in cases of rheumatism. I have given briefly the views which I have been led to entertain, and which are strengthened in my mind by their coincidence with the views lately enunciated by Dr. Fuller. In leaving this point, I would state that I am accustomed to use habitually Cammann's stethoscope, and that murmurs are discovered by means of this instrument which elude detection when the ear is applied directly to the chest or the wooden cylinder is used. The large proportion of cases in which a murmur at the base was noted is perhaps to be thus explained.

Pericarditis was developed in one of the cases. And in this case pneu-

[1] Dr. Fuller's remarks on this point, in the lecture republished in the *Med. News and Library*, number for March, 1863, seem to me to be sound, and I would commend them to the reader's attention.

monia occurred shortly after the development of pericarditis. This case was the last one under observation. Had it been at an earlier period I might have been deterred by it from continuing the plan which I had adopted; but up to the occurrence of this case, all the cases had pursued a favourable course, without any important complication. Endocarditis was supposed to exist when this patient was admitted. The diagnosis of this complication was based on a pretty loud mitral systolic murmur, propagated without the apex. It was also heard on the back. And with this were associated tenderness over the præcordia, and an excited action of the heart greater than would be expected from the rheumatic affection alone. The pericarditis was developed on the second day after her admission, and the pneumonia a few days subsequently. The endocarditis already existing, and the pericarditis being developed so quickly after admission, I am relieved of responsibility as regards the adoption of therapeutical measures which it may be supposed might have prevented these complications. The question, therefore, is, would these complications have been prevented had the patient entered the hospital sooner, and active treatment been at once employed? This question I shall not presume to answer. The case illustrates the well known fact in the natural history of articular rheumatism, viz., that endocarditis, pericarditis and pneumonia are developed in a certain proportion of cases. The gist of the question is, whether the introduction of alkaline remedies, or any other method of treatment, will render the patient secure against, or less liable to, these complications. I certainly have no desire to come to the conclusion that these complications are not preventable; but it is certain that the different methods of treatment heretofore in vogue have failed to prevent their occurrence. Dr. Fuller, in the lectures already referred to (which have fallen under my notice since the greater part of the cases now reported were observed), claims that the prompt and efficient employment of the alkaline treatment will afford a complete protection against the cardiac affections. He administers about two drachms of some alkaline carbonate, or its salts, every three or four hours, inducing alkalinity of the urine generally within twenty-four hours. When this result is brought about he considers the patient safe as regards endocarditis and pericarditis. He affirms that these affections have not occurred in any case under his observation when the opportunity for pursuing this treatment has offered. I have not been accustomed to give alkaline remedies to such an extent, and, so far as I know, it is not the custom with the practitioners in this country who have adopted the alkaline treatment. Should clinical experience establish the efficacy of the method pursued by Dr. Fuller, it will assuredly deserve to rank among the most important of modern discoveries in practical medicine.

Art. II.—*Reports of Cases of Resection.* By C. Wagner, M.D., Assistant Surgeon, U. S. A., Medical Director 2d Division 5th Army Corps.

During the past few years, the operations belonging strictly to conservative surgery have assumed the highest importance. Before the present rebellion, and the recent wars on the Continent of Europe, they were regarded with distrust and suspicion, by most civil surgeons, and in this country particularly, they have been greatly neglected, owing in a great measure to the absence of reliable statistical information. The valuable monographs of Hodges, of Boston, and Heyfelder, of Vienna, should remove all doubts as to the propriety and expediency of operations which not only save limbs, but are attended with less fatality than amputations.

The results of the following cases, the reports of which are drawn up by Acting Medical Cadet I. S. Lombard, U. S. Army, will, I think, stand a fair comparison with others. The after-treatment, upon which so much depends, was very simple; splints were applied in one case only. Two cases of partial resection resulted unfavourably; Case IV. in death, the other (not reported), in which resection of the head of the ulna was performed, the forearm was subsequently amputated, and the patient recovered.

Case 1. *Gunshot Wound of the Elbow-joint. Resection performed.*—Henry McMurphy, æt. 28, a private in the 5th N. H. Vols., was wounded at Fredericksburg, Dec. 13th, by a minie ball, which striking the posterior aspect of the left ulna, about two inches below the extremity of the olecranon, shattered the bone, breaking off its upper extremity, and involving the joint in the fracture; a piece of bone composed of a small portion of the shaft of the ulna, half of the lesser, and a piece of the outer edge of the greater sigmoid cavities, being split off. The ball lodged in the arm, and was removed on the field. When the patient was admitted to this hospital, three days after the reception of the wound, there was very little swelling or inflammation in the arm, slight motion in the injured joint, every movement of which caused the man great pain.

*December* 18. It was decided to resect, and the patient having been brought under the influence of chloroform, the articulation was exposed by Moreau's method, and the condition of the bones found to be such as described above. The upper extremity of the ulna was next disarticulated, and the shattered extremity of the lower portion of the bone sawn off. The head of the radius was uninjured, but was removed, in order that the parts might be brought into closer apposition. A small piece of the articular surfaces of the humerus was now shaved off, and the edges of the wound brought together, and a bent gum splint applied to the flexor side of the arm and forearm.

The operation was performed by Clinton Wagner, Asst. Surgeon, U. S. Army, in charge of Hammond General Hospital. The following day, there being some inflammation in the arm, the splint and sutures were removed, and the arm laid on a pillow, with the forearm pronated and slightly flexed, and cold water dressing applied. The progress of the case was on the whole favourable. By the end of the third week passive motion was made,

and from time to time repeated. By the last of February the external wound had healed, the arm could be fully flexed and extended by passive motion, with slight pronation and supination.

CASE 2. *Gunshot Wound of the Elbow. Resection.*—James Douglass, a private in the 63d Penna. Vols., was wounded at Fredericksburg, Dec. 13th, by a minie ball, which entered on the external aspect of the left forearm, about over the neck of the radius, and made its exit just above the inner condyle, shattering in its course the radius at its neck, and breaking off portions of the coronoid process, internal aspect of the olecranon and trochlea. The patient was admitted to Hammond General Hospital Dec. 16th.

*January* 12. Resection of the injured bones was performed by Asst. Surgeon W. H. Gardner, U. S. A. The joint having been exposed by the quadrilateral flap operation of Moreau, the radius was sawed off just below its tuberosity. The upper extremity of the ulna, and the articular surface of the humerus were also removed. After the operation the limb was laid on a cushion, with the forearm pronated and slightly flexed. When last seen, March 6th, 1863, the movements of the joint were tolerably free, extension full, flexion about five degrees above a right angle, slight pronation and supination, the movements increasing almost daily.

CASE 3. *Gunshot Wound of the Elbow-Joint. Resection performed.*—Private Jeremiah Wellover, of the 131st Penna. Vols., æt. 22, was wounded at the battle of Fredericksburg, Dec. 13th, by a minie ball, which entering the posterior aspect of the left arm, shattered the olecranon, and lodged just in front of the inner condyle, whence it was extracted soon after his arrival at Hammond General Hospital, which was Dec. 16th, 1862.

*January* 10. Resection of the injured joint was performed by Dr. Theo. Siebold, Acting Asst. Surgeon, U. S. A. The articulation having been exposed by the longitudinal incision advised by Langenbeck; the ulna was sawed off just below the coronoid process, also the head of the radius, and the articular surfaces of the humerus. The head of the radius escaped injury, and the articular surfaces of the humerus were but slightly comminuted. After the operation the forearm was placed at a right angle with the arm, and retained in this position by a plaster of Paris splint.

*February* 16. The splint was removed, and the arm laid on a cushion, with the forearm slightly flexed, and the hand pronated. When the patient was last seen, Feb. 28th, the external wound had healed, and the movements of the joint entirely free, extension full, flexion ten degrees above right angle, and increasing daily; pronation and supination free to full extent.

CASE 4. *Gunshot Wound of the Forearm, with Fracture of the Ulna. Resection of the upper extremity of the injured bone.*—Private Alfred Hunt, of the 72d N. Y. Vols., was shot through the left forearm at Fredericksburg, Dec. 13th, by a minie ball, which shattered the ulna extensively about its middle third. After his admission to Hammond General Hospital, Dec. 16th, a number of small pieces of bone came out from time to time mingled with the discharge from the wound, which was very profuse. As no improvement took place in the case during the month of December, and as the mans's health was evidently giving way under the irritation and profuse suppuration of the wound, operative interference was deemed necessary, and on the 11th of January, chloroform having been administered, an incision was made along the internal and posterior aspect of the bone, from the in-

ner condyle downwards, for the distance of four inches. The bone having been thus exposed, was next disarticulated at the elbow, and removed; the shattered extremity of the lower portion was then sawed off, thus removing in all, about half of the bone. The operation was performed by Asst. Surgeon C. Wagner, U. S. Army, in charge of Hospital. He died on the 12th day after the operation, of pyæmia.

CASE 5. *Gunshot Wound of the Shoulder with Fracture of the Head of the Humerus. Resection performed.*—Robert Campbell, æt. 28, a private in the 4th New York Vols., while lying on his face, exposed to a sharp fire at the battle of Fredericksburg, December 13, 1862, was struck by a minie ball in the left shoulder, about two inches to the outside of the extremity of the acromion. The ball shattered the inner and posterior aspect of the head of the humerus, and then passed down and lodged on the inside of the arm just below the axilla, and was extracted a few days after the battle. When admitted to Hammond General Hospital, December 16, the patient was suffering from chronic diarrhœa, which continued for some time after his arrival unchecked, and reduced him so much that he appeared too weak to endure an operation. He also suffered an attack of jaundice. During the first part of January, 1863, the man improved so much that on the 17th, chloroform having been administered, the head of the bone was resected by Assistant Surgeon C. Wagner, U. S. Army, in charge of hospital. The articulation was exposed by the V-shaped incision, and the bone sawed across just below the tuberosities. The glenoid cavity, acromion, and coracoid escaped injury. The after-treatment consisted in placing a pad in the axilla and supporting the arm in a sling. Cold water dressing. The wound healed favourably. At the time of writing, March 10, the patient has full and free use of the forearm, and by passive motion the arm can be elevated to a right angle with the body, and has all the other movements except rotation. Voluntary motion is increasing almost daily.

CASE 6. *Gunshot Wound of the Elbow with Fracture of the Inner Condyle and Olecranon. Resection performed.*—Private Morris Lewis, of the 133d Pa. Vols., æt. 19, was wounded at the battle of Fredericksburg, December 13, 1862, by a minie ball in the posterior aspect of the left arm just over the olecranon. The inner portion of the olecranon was shattered, and the inner condyle with a portion of the trochlea broken off. The ball lodged among the muscles on the anterior aspect of the forearm about over the head of the radius, and was cut out December 25. The patient arrived at Hammond General Hospital December 16. At this time his general condition was good, and continued so after his admission. There was considerable swelling of the elbow and forearm, which alternately subsided and increased every few days up to the time of operation.

*January* 15, 1863. Chloroform having been administered the articulation was exposed by the quadrilateral flap operation of Moreau, and the olecranon sawed off at the base of the coronoid process. The detached inner condyle which was thrown forwards and inwards was next removed, and the ulnar nerve was found to be intact. The lower extremity of the humerus was then sawed off just above the condyle. The operation was performed by Dr. T. H. Allison, Act. Asst. Surgeon, U. S. A. The flap was laid back and the edges of the wound brought together and retained by eight sutures.

21*st*. Strips of adhesive plaster were applied in order to bring the edges of the wound into closer apposition, an opening being left for the escape

of pus. After the operation the arm was supported by a cushion, the fore-arm being pronated and slightly flexed. The case did well, and when last seen the wound had healed. The joint has motion as follows, extension very nearly perfect, flexion about ten degrees with elbow at a right angle, and about half the full extent of pronation and supination; movements increasing daily.

CASE 7. *Gunshot Wound of the Shoulder-Joint. Resection performed.* Sergeant Michael Dolan, æt. 25, of the 2d U. S. Infantry, was wounded at the battle of Fredericksburg, December 13, in the left shoulder by a conical ball, which, striking the tip of the acromion, comminuted it slightly, and then passing into the articulation shattered the head of the humerus, splitting the shaft of the bone for the distance of two inches below the tuberosities, and finally lodged in the anterior and inner aspect of the bone. At the time of the reception of the wound the patient was lying on the ground resting on his elbows. When admitted to Hammond General Hospital, December 16, there was great swelling of the joint, and the patient seemed much debilitated. All attempts to discover the ball failed. The patient was freely stimulated and carefully watched in order to bring him up sufficiently to endure resection. Early in March his condition had improved sufficiently to warrant an operation. He was, therefore, etherized, and the articulation exposed by a V-shaped incision, and the humerus sawed across about two inches below the tuberosities. The ball was found on the inner aspect of the bone about an inch and a half below the head. The glenoid cavity was somewhat ulcerated. At the time of writing, March 25, his condition is such as to warrant hopes of a successful termination. The operation was performed by I. Stearns, Jr., Act. Asst. Surgeon, U. S. A.

CASE 8. *Gunshot Wound of Hand. Resection of the Metacarpal Bones.*—Joseph Shingledecker, Co. A, 134th Pennsylvania Volunteers, wounded at Fredericksburg, December 13, 1862, was admitted into Hammond General Hospital December 16, 1862. Gunshot wound of right hand. Ball striking the index finger, shattering the first phalangeal bone, and passing obliquely across the hand shattering the third, fourth, and fifth metacarpal bones, injuring the soft parts materially but not destroying the tendons. Wound very much inflamed, swollen, and presenting an unfavourable appearance.

*Treatment.*—Slippery-elm poultices.

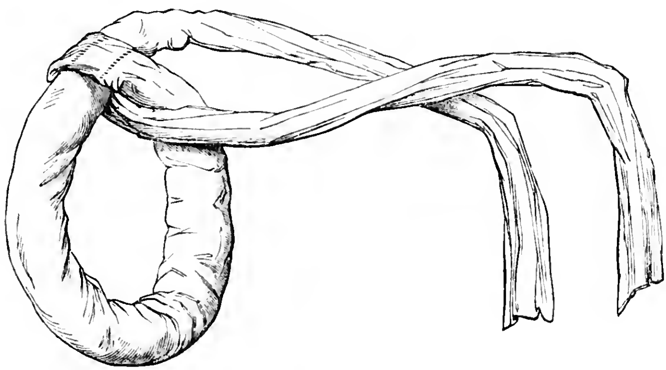
On the 20th of December the wound looking less inflamed, the general health good, and there being no hope of reunion of the bones, owing to the extent of injury, ether was administered and an incision made over the first phalangeal bone of the index finger and the entire bone removed. The third, fourth, and fifth metacarpal bones were removed in the same manner, viz: by longitudinal incisions. The soft parts were then brought together, the hand placed on a splint, with cold water dressing. The wound healed kindly with no unfavourable symptoms, and the patient left the hospital on the 20th of March, the wound entirely healed; the muscles having contracted so as to bring the end of the second phalangeal bone of the index finger very close to the head of the second metacarpal bone.

The hand presented a contracted but well-shaped appearance; loss of motion in the index finger, slight motion in the middle and ring fingers, full and perfect use of the little finger and thumb; the patient could write a fair and very legible hand.

ART. III.—*Description of an Apparatus devised for Fracture of the Clavicle.* By Surgeon J. C. PALMER, U. S. N. (With three wood-cuts.)

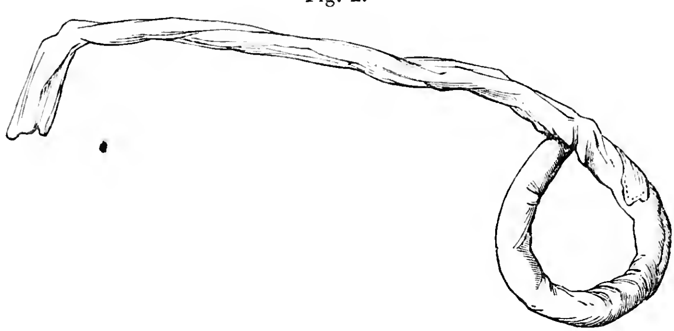
A SHEET, folded so that it shall be transversely two feet six inches, is rolled into a cylinder three inches in diameter. This is placed longitudinally in the middle of a piece of cotton cloth six feet six inches in length, rolled up tightly, and fixed by stitches. The free cotton cloth extends two feet from each end of the cylinder. The latter is bent so that one end overlaps the other about three inches, and is secured in this position by stitches. One loose end of the cloth is carried once over the cylinder near the other end, and through the oval opening (see Fig. 1). This is for the uninjured side.

Fig. 1.



For the injured side another cylinder is constructed in a similar manner, with these exceptions: It is but one foot six inches in length, one inch and

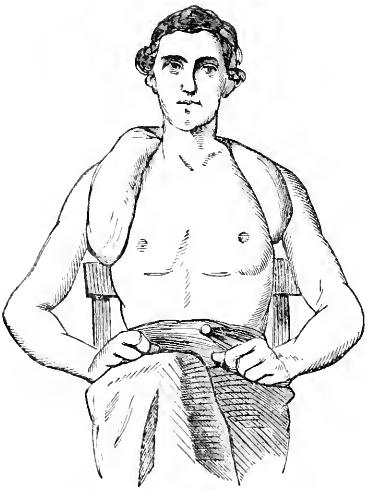
Fig. 2.



a half in its transverse diameter, and is rolled longitudinally into one end of a piece of cloth three feet six inches in length, so that there is but one free end of cloth, and that two feet long (see Fig. 2).

By passing the arms through the oval openings, the rings are placed so that they pass under the axilla and over the acromion processes. The larger ring, where its ends overlap each other, extends upwards and backwards about four inches when yielding to pressure. The free cotton cloth extending from the higher overlapping end, is passed under the opposite ring, and the free end of this latter is in like manner passed through the larger ring (see Fig. 3). These two are brought to a proper tension for lifting the injured shoulder, and are so held by an assistant. Then the free cloth extending from the lower end of the larger cylinder, and passing through the smaller one, from without inward, is carried across the back, and drawn tightly enough to carry the scapulæ backward as far as may be desired. The ends are then tied together. The arm of the injured side falls over that part of the smaller ring passing under the axilla and by its own weight, acting as a lever, keeps the shoulder outward; the elevation of the larger ring, causing the cotton cloth to draw upwards keeps it upwards, and the band passing across the back from one ring to the other keeps it backward. Thus every indication is fulfilled.

Fig. 3.



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ART. IV.—*Report of five cases of Gunshot Injury of the Knee-joint, treated at Mansion House Hospital, Alexandria, Virginia, May* 16, 1863. By J. B. BELLANGER, Act. Asst. Surg. U. S. Army.

So discouraging was the result of secondary amputations, after the battles of Cedar Mountain and Bull Run *No.* 2, for injuries of the knee-joint, at this hospital, that it was determined, on the next favourable occasion, to try the effect of conservative surgery, and see if a better success would not follow if the joint was freely laid open at an early period, all loose bone removed, all collections of pus in the neighbourhood of the joint evacuated as soon as detected, and the parts constantly irrigated by ice water. After the battle of Fredericksburg, Dec. 13, 1862, six cases of gunshot injury of the knee-joint were received into this house; in one, the

most favourable case, amputation was performed at the middle third of the thigh; death ensued nine days after the operation, of pyæmia. The other five were treated after the manner suggested above, with no more favourable result.

Case I.—Private Augustus Luce, 16th Maine, 20 years old, wounded Dec. 13, and admitted Dec. 19, 1862. Ball entered the inner side of right knee, breaking off the inner condyle of the femur, and passing out underneath the external condyle. In a few days after admission, evidence of suppurative inflammation being present, the patient was put under the influence of chloroform, and I opened the joint by a free incision on its outer side, letting out considerable pus and serum, and removed all the loose and comminuted bone.

*Dec.* 31. Has been quite comfortable since the operation, giving him best of diet, wine and iron, with constant cold irrigation.

*Jan.* 3, 1863. Still continues to do well; wound is suppurating freely and looks healthy; pulse soft and full; appetite tolerably good.

6*th*. Wound still healthy; pulse full; is cheerful; more or less infiltration of pus about the joint.

8*th*. Burrowing of pus between the muscles on the inner side of the thigh; tongue somewhat dry; pulse more feeble; hectic flush in the face; gave him tinct. ferri muriat., wine, and best of diet.

10*th*. Pulse very rapid and feeble; tongue dry; mind wandering a little; anorexia; suppuration very free, dissecting up the muscles of the calf and thigh in spite of every effort to prevent it by proper compress and bandages.

14*th*. Condition very much the same for the last four days: pulse 120 and feeble.

18*th*. Tongue not so dry; appetite better; pulse fuller, 100 per minute; wound still looks healthy; pus continues to burrow freely between the muscles of the thigh.

19*th*. Not so well this morning; pulse thready and rapid; has had a chill; complains of great thirst; wants nothing but cold water; pupils contracted; pus from wound dark coloured and fetid.

20*th*. Pulse about as yesterday; countenance looks pinched; very restless; pupils still contracted; toes and foot of wounded limb dark purple; pus from wound dark and very fetid; complete anorexia. Have been giving him strong stimulants, and whatever of food he would take.

21*st*. Pulse scarcely perceptible; muttering delirium. Died, exhausted, 5 o'clock P. M.

*Post-mortem* 20 *hours after death*.—Found the outer side of the external condyle of the femur, under side of the patella, anterior part of the spongy head of the tibia, the entire articulating surface of the tibia with the femur, all necrosed and of a dark colour; muscles of the calf and thigh dissected up and infiltrated with fetid pus.

The two following cases were in the ward of Act. Asst. Surg. G. F. French, who has kindly furnished me with the following notes:—

Case II.—Pr. Wm. C. Fay, 11th Pa., wounded Dec. 13, admitted Dec. 19, 1862. Ball entered the external side of the spongy head of the tibia of the left leg, about a quarter of an inch below the articulation, and remained in the bone.

*Dec.* 27. Cautious incision for the ball; hole small—must have been made by buckshot; ball could not be felt.

*29th.* Inflammation and tenderness about knee beginning; veins red, not blue; cold irrigation constantly applied.

*30th.* Inflammation increased; veins enlarged and blue.

*31st.* Knee-joint involved; full of pus; free incision made and ball extracted from spongy head of tibia.

*Jan.* 1. Pulse 150; great dyspnœa; wound not suppurating well; looks red, and a purplish blue all over the knee; complexion very sallow. Night. Pulse small and rapid; complexion yellow as gold.

*3d.* Pulse rapid and feeble; wound dry, livid and yellow; pus from it abnormally yellow. Died at midnight.

*Post-mortem 12 hours after death.*—Infiltration of abnormally yellow pus for four inches above the knee on the upper side; periosteum destroyed on the inner and outer edge of the articulating surface of the femur; otherwise the periosteum and articular cartilages perfectly healthy. Entire articulating surface of the tibia healthy, except a narrow border on the external side, at which point incipient necrosis was manifest; head of the fibula not in the least involved, either primarily or secondarily. There is a hole in the head of the tibia, made by extracting the ball, abont the size of a minie ball. The adipose tissue throughout the body of a golden yellow. Left ventricle of heart hypertrophied; one of the valves of the aorta obstructed by a fibro-cretaceous deposit. Right lung healthy; yellow fibrous and curdy deposit over the surface of left lung; small abscesses throughout the lower lobe of left lung; parenchyma of left lung in state of red hepatization. The rapidity with which the whole body became jaundiced was truly remarkable; while the liver exhibited no sign of disease after death. The gall-bladder was empty. Urine of a deep yellow colour.

CASE III.—Pr. Joseph Tetlow, 23d New Jersey, wounded Dec. 13, admitted Dec. 19, 1863. Ball entered on outer side of the popliteal space of right leg, lodging on the under side of the internal condyle of the femur, from which place it was extracted by Dr. French.

*Dec.* 23. High constitutional fever; there is great pain and swelling about the joint.

*29th.* Free incision into joint let out a quart of pus; bandaged the leg.

*30th.* More comfortable; feverish; pulse feeble; had slight chill; complains of pain at pit of stomach.

*Jan.* 2. Pulse very feeble and slow; hectic flush. Died in the afternoon of this day.

*Post-mortem.*—External condyle bared of periosteum; joint full of pus; external portion of articular surface of tibia bared also; muscles of the lower third of femur dissected up by the pus; periosteum off on the inner side and end of internal condyle; bone beginning to necrose; heart, lungs, and liver healthy.

*Remarks.*—There were two other cases under the care of Acting Asst. Surg. O. F. Sheldt, the notes of which were not kept. Both terminated fatally under the same general treatment. To an inexperienced surgeon it would seem impossible that cases presenting so little mutilation as these did when they were received in the hospital, would prove so inevitably fatal—and in these days of conservative surgery the temptation is very

great to make an effort to save the limb. Yet the result in these five consecutive cases, under the most favourable circumstances, adds but another proof to what has long ago been recorded by Guthrie, Ballingall, Larrey, Macleod, and many other writers on military surgery, that the only hope for any one, when the knee-joint has been opened by a gunshot wound, is in immediate amputation. Had these cases been amputated on the field, instead of sending them to the general hospital, there is every reason to believe that three out of the five might have been saved.

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ART. V.—*Remarkable Case of Vesical and Urethral Calculi, in a Boy Twelve Years old. Forty-five Stones successfully removed from the Bladder.* By J. F. SANFORD, M. D., of Keokuk, Iowa. With three Woodcuts.

WILLIAM ELLIOTT, aged twelve years, applied to me for surgical treatment, December 13, 1862. I obtained the following history of the case from his father:—

He is a native of Pasquotank County, North Carolina. His figure is slight and his constitution much impaired by frequent attacks of illness. During infancy he suffered from protracted cholera infantum, which continued, more or less, till he was three years old. At that age, or a little later, he was attacked with hooping cough, which continued through an entire winter, attended with symptoms of unusual severity. This disease brought on repeated and copious hemorrhages from the lungs, and, when it subsided in the spring, left him much emaciated. During the succeeding summer, and before his health was entirely restored, symptoms of stone in the bladder made their appearance, causing considerable pain and slight straining in urination; at the same time obstruction to the free flow of the water occurred, which sometimes required energetic treatment for its removal.

These paroxysms occurred about once a week with but little variation in their severity until the spring of 1857. At this time they became much more painful and occurred more frequently. Incontinence of urine was now added to the sufferings of the patient, and every effort at micturition occasioned distress. In 1858 he had an attack of measles. This increased the pre-existing morbid condition and rendered the boy's agony almost insupportable. Some time in August last—1862—inflammation was developed in the perineum, attended with the usual symptoms of pain, swelling, &c., which continued with unabated severity—involving the scrotum and neighbouring parts—until suppuration and ulceration resulted establishing the condition of fistula in perineo. At one time during the greatest intensity of this local condition, when extravasation of urine into the cellular tissue had occurred, the inflammatory tumefaction exceeded an orange in size, and threatened extensive gangrene and sloughing of the parts. This finally subsided under treatment to the size of a walnut, the

surface presenting five or six perforations, through which the urine constantly dribbled. During the height of the local inflammation, the constitutional symptoms were very severe, and for some weeks the patient's life was despaired of. After it partially subsided he remained very weak and irritable, and the symptoms of stone in the bladder, before detailed, were much aggravated.

The history of the case above given will enable the reader to appreciate the condition of the patient at the time of his arrival in the city in search of relief. His emaciation was extreme and his sufferings indescribable. When I first saw him lying on his bed, I supposed it was some one suffering the intense pain of a recent injury. The head was bent down nearly to the knees, which were grasped by the hands, and the countenance, pale and thin, was expressive of the utmost agony. The intensity of the pain intermitted every five or ten minutes, not to be followed by ease or rest, but only to a degree more endurable by the patient; but I do not think during that day, or for several days after, whilst under my immediate observation, he passed an hour at any one time free from severe pain.

The case being thus attended with such extreme suffering, and otherwise presenting many points of more than ordinary interest, I allowed his father, who accompanied him, to prepare an upper room in my building for his reception, where I could have him under my hourly notice. The day after his arrival I made an inspection of the external parts, and found them presenting the following appearance :—

The prepuce, elongated at least an inch beyond the glans, was slightly red and tumefied; the lower part of the scrotum was enlarged and indurated, and below it, about half an inch, was a regularly circumscribed tumour, an inch in diameter, and elevated three-quarters of an inch above the surrounding surface. This tumour was inflamed and irritable, and perforated with five small openings, through which the urine would pass in small jets during each paroxysm of pain. A small portion of urine would also occasionally pass out through the natural channel. Still below this tumour the parts—that is, the perineum between it and the anus—were swollen and tender, a condition much aggravated during the straining pain which occurred so frequently.

Notwithstanding the local inflammation had greatly subsided, and consequently the fever had measurably passed away, the system was extremely irritable. The pulse during the week before the operation was seldom found below 120, the skin was hot and dry, the tongue coated, the thirst considerable, and the appetite weak and capricious.

Under these circumstances the sounding was postponed until the third day after the patient's arrival, and in the meantime his bowels were opened by gentle laxatives, mucilaginous and slightly alkaline drinks enjoined, and a few hours before he was sounded eight grains of Dover's powder were given.

This course having allayed to some extent the irritable condition, I proceeded in the presence and with the assistance of Drs. Whinnery, of Fort Madison, and Sala, of West Point, to sound him. The sound, a No. 8 steel bougie, was passed with some difficulty along the urethra into the bladder, encountering in its way two stones—one at the point of the perineal tumour above described, and the other three-fourths of an inch beyond. The instrument passed these calculi readily, but impinged closely upon their surfaces. The space intermediate between them, as also the urethra between the second stone and neck of the bladder, appeared to be

contracted, and opposed an obstacle to the onward progress of the sound. This contraction appeared greatest in the prostatic portion of the urethra, and for some time it seemed impossible to reach and enter the bladder. When by gentle perseverance this was accomplished, the nature of the case became obvious, and nothing remained but to prepare the patient for the necessary operation. This was done by putting him on a light, but nutritious diet, keeping the bowels open with mild laxatives, and enjoining mucilaginous and slightly alkaline drinks.

*Operation.*—The patient came to me December 13th, 1862, and by the 20th I considered him sufficiently prepared for the operation of lithotomy. On the evening of the 19th he took a dose of castor oil, and on the morning of the 20th the rectum was well emptied by tepid water injection. Having prepared means to meet the exigencies of a complex and difficult operation, I proceeded to its execution on the day stated, in the presence of several medical gentlemen and students, but particularly assisted by Dr. E. M. Sala, of West Point. The incision was made as usual in the performance of the lateral operation, except that it was begun a little higher, in order to approach the seat of the fistulous openings as nearly as possible, so as to facilitate the removal of the urethral calculus there located. On reaching the staff, it was found considerably to the right of the raphé or middle line, having been so deflected by the large urethral stone. I could not perceive at this point the ordinary circumscribed tissue of the urethra, but only a general expansion of all the tissues, forming a cavity in which it now appeared, a large calculus was lodged. Ascertaining by the finger and probe the dimensions of the stone, the cavity was opened to the extent of an inch upon the staff, which was then withdrawn. The forceps were now applied as well as possible to the calculus and an attempt made to extract it; but after repeated trials it appeared impossible to accomplish it in this way. It seemed to be so firmly impacted that the forceps could not grasp it with sufficient firmness; they would slip off, fracturing the external layer, but leaving the main body of the stone unmoved. I now took a steel gouge, slightly curved at the cutting end, and carefully insinuating it alternately around either side of the stone, succeeded at last in dislodging it from its bed. Its location was at the proper site of the membranous portion of the urethra, but we could trace no vestige of the normal structure; the cavity extended from the anterior margin of the prostate gland to the bulb of the urethra, and to the extent of half an inch or more on either side of the median line. Beyond this cavity the urethra, that is the prostatic portion, seemed to be less than the usual size, and, as far as I could see, this contraction embraced its entire extent.

I now passed a small silver female catheter into the bladder to be used as a sound, and found that organ literally crowded with stones, the grating upon the instrument and upon one another as they were moved about by it, being quite audible. It was now necessary to extend the incision, and to accomplish this a straight staff was introduced, into the groove of which the point of a beaked scalpel was placed and pushed, properly lateralized, through the prostate into the bladder. Through this incision, after dilatation with the finger, the forceps were passed, and one after another several of the larger stones removed. The scoop was then substituted and the bladder emptied of its contents, with the exception of a considerable quantity of debris lying in the *bas fond*, and some gritty and scaly matter adhering to the walls. After clearing this latter from the mucous membrane

with the finger passed in every direction around the cavity, it was thoroughly washed out by repeated and forcible injections of warm water. After a careful examination of the spongy portion of the urethra, the operation was considered complete. It was done in less than fifteen minutes, the patient being under the full influence of chloroform and unconscious of any suffering during the entire period thus occupied It was the opinion of all present that less than an ounce of blood was lost during the operation. The patient rested well during the day and night following, being entirely free from pain, and enjoying a night's calm repose, to which, for years, he had been a stranger. No febrile reaction occurred, not the slightest inflammatory action manifested itself in the pelvic or abdominal viscera, and in fact we may say, without noting a single exception, that the patient rapidly recovered without an unfavourable symptom.

At the end of two weeks, the wound being nearly closed, we deemed it expedient to introduce and retain a silver catheter. The alteration of the tissues produced by long continued disease and the presence of foreign bodies in the urethra, endangered its occlusion in a considerable portion of its extent during the process of union and repair, and this, together with the yet unclosed condition of the fistulous openings near the scrotum, rendered the use of a catheter necessary. There were circumstances connected with the morbid condition at the seat of these fistulæ, that precluded the probability of their cure, even by the use of this instrument. There were several openings; they had been protracted and obstinate, and lastly, the internal opening was very large. I therefore determined to lay open the parts by an external incision and heal them over the silver catheter. This was accordingly done, the incision being made upon a staff. In carrying the knife through the parts it was evident that a calculus was imbedded in the swollen and indurated parts external to the urethra. Its situation entirely outside of that canal, caused us to miss it in our search for more stones after the operation was deemed complete. Not being prepared at the moment of its discovery to extend the operation and remove it, that proceeding was postponed and the wound dressed. In removing the dressings subsequently the stone came away with them. It is of the size and shape represented by Fig. 1.

The swelling and redness now rapidly subsided, and in the course of a few days the wound had closed with the exception of a small orifice not larger than a pin's head. The patient's general health in the meantime rapidly improved, and he left for home on Tuesday, Jan. 20th, 1863.

Owing to the strongly marked diathesis and tendency to relapse existing in this case, the patient was put upon the occasional use of nitric acid, a daily cool bath directed, and a plain nutritious diet and exercise in the open air enjoined.

*Number and composition of the stones.*—It was our impression at the time the stones were being removed that they did not number more than eight or ten. Their softness, friability, and covering of mucus and blood, prevented a correct estimate of their number, and created the impression that they were broken into numerous fragments by contact with the instruments during extraction. But after being cleansed in the most careful manner, they were closely scrutinized and counted in the presence of Drs. Sala and Pittman, and every one not presenting an entire unbroken surface was excluded. There were 47 of these distinct calculi, and of those showing more or less of a fractured surface, over 100. They are of every shape and

obscurely laminated. The largest perfect stone is the one which was imbedded in the membranous portion of the urethra, the size and form of which is here shown (Fig. 2).

Fig. 1.

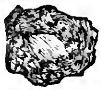

Fig. 2.

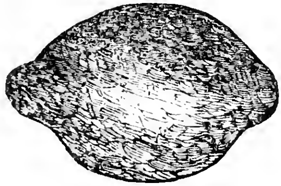

Fig. 1.—Actual size and shape of small Urethral Stone located in *cul-de-sac* at spongy portion of the Urethra.
Fig. 2.—Large stone located in the membranous portion of the Urethra.

This stone measures three inches and three-quarters in its long, and three inches in its short circumference. The largest vesical calculus is two inches and a half in circumference—the smallest about the size of a pea. The aggregate mass of the fragmentary portions would exceed in bulk the larger urethral stone. The aggregate weight is within a small fraction of two ounces. The mass thus described filled the bladder, which was closely contracted around it, and forcing, by its spasmodic action, the stones into the vesical triangle and neck, thus arresting the function of the *sphincter vesicæ*, and causing the leaking and dribbling of urine before alluded to. The following illustration is designed to represent this condition:—

Fig. 3.

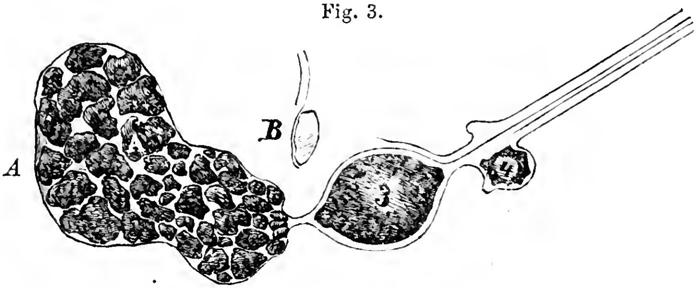


Fig. 3.—Showing Bladder, Urethra, &c. *A.*—Bladder full of stones. *B.*—Pubic Bone. 4.—Small Urethral Stone. 3.—Large stone in membranous portion of the Urethra. Between the neck of the bladder and the large stone is seen the prostatic portion of the Urethra, contracted by disease and structural change.

It may well be imagined that a bladder thus situated, and subject for years to the presence of foreign bodies provoking irregular and spasmodic action, would become the seat of morbid alterations of form and structure. Such alterations were quite obvious in this case. The form of the organ was elongated and contracted slightly in the middle, as above represented, whilst there was an irregular thickening of the coats, as is sometimes apparent from hypertrophy of the muscular fibres. This was so great in some portions of the organ as to resemble the retiform arrangement existing in columniform bladder.

From the appearance and obvious character of these stones, we had but little doubt as to their chemical composition. They were pale coloured, of

earthy texture, smooth and soft. A section of any particular stone exhibited a uniformity throughout the mass. From these indications we believed them to be composed of the triple phosphate of ammonia, magnesia, and lime, but as, in a case of so much importance, it was desirable to establish the fact of their composition as clearly as our means would allow, we subjected them to a careful analysis. This process had reference, of course, only to the qualitative investigation, but the experiments and application of the tests were decisive and satisfactory. The following is briefly the method pursued in which I had the assistance of my pupil, Mr. J. A. Webster:—

A portion of the calculus placed on platinum wire was subjected to the action of the blow-pipe, by which it was speedily blackened. This result was due to the animal matter always present in earthy calculi. It then became white, and by continued action of the flame was imperfectly fused into a kind of vitreous grit. During the process a distinct ammoniacal odour was exhaled. A portion of the incinerated mass was then dissolved in chemically pure nitric acid diluted, and this solution divided into two parts. One part was taken, and after neutralizing the excess of acid by a solution of the bicarbonate of potash, it was tested with a strong solution of nitrate of silver, which produced a beautiful yellow precipitate. This precipitate was phosphate of silver, and thus demonstrated the presence of phosphoric acid. The second part of the solution was *nearly* neutralized with ammonia; to this a solution of oxalate of ammonia was added, which after a short interval produced a white crystalline deposit. This precipitate was the oxalate of lime. After it had entirely subsided, the clear liquid was poured off, and this liquid, when tested with caustic ammonia, produced a crystalline precipitate of triple phosphate. To this demonstration of the presence of magnesia was added other familiar tests. This analysis, thus limited to a qualitative definition, was more elaborate and varied than here described, and to our minds was sufficiently satisfactory.

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ART. VI.—*Hospital Gangrene as it appeared in St. John's College Hospital, Annapolis, Md.* By JAS. W. PITTINOS, Asst. Surgeon 67th Regt. Pa. Vols.

ON the morning of Jan. 11th, the steamer New York arrived at this port, bringing a large number of sick and wounded from Richmond, Va., the majority of whom were wounded at Fredericksburg, Dec. 13th, 1862, and had been treated in the Libby Prison Hospital.

At the time of their admission into this hospital, the wounds presented no unusual appearance, with the exception of those of Henry Larke, of whom I shall speak presently. Our hospital has had every attention bestowed upon it to prevent the origin of any disease, which is produced by filth, bad ventilation, &c., and from what I have learned since, I am satisfied that the disease was brought from Richmond in the New York, as I have been informed by an intelligent officer that it prevailed there to a considerable extent, and that many had died.

Case 1. The first person in whom it appeared, was Henry Larke, Co. G, 8th Pa. Reserve Corps. This young man was eighteen years of age, delicately framed, and had a gunshot fracture of the radius of the left arm. He was the only person whose wound did not appear healthy. On the 12th I noticed the disposition of the wound to slough, and applied nitric acid diluted with an equal quantity of water. This treatment was continued until the 14th, without effect; the disease continued to spread. On the 15th, the pure acid was applied to the diseased surface, and around the wound on the healthy skin. This was followed by a poultice, composed of one part by weight of powdered charcoal and three of cornmeal, made of the proper consistency with fresh yeast, which was renewed every five hours. His pulse was 130 per minute, tongue clean, skin cool, and bowels regular; his food consisted of roast beef and potatoes, beef-tea, soft boiled eggs, farina cooked in milk, rice, egg custard, and a pint of porter daily.

The disease first attacked the point of entrance of the ball and subsequently the point of exit, and soon involved the muscles of the anterior and posterior parts of the forearm. The fetor was very great, and the wound assumed an oval form. The wound continued to get worse until the 29th, notwithstanding all my efforts to stop the progress of the gangrene, and as amputation seemed to offer the only prospect of saving his life, I performed the flap operation midway between the elbow and shoulder joints on the 30th, assisted by Act. Asst. Surgeons K. O. Crane and Radcliffe, U. S. A. The inflammation had extended as far as the elbow, and the forearm was enormously enlarged and livid. He took immediately after the operation fifty drops of laudanum and two ounces of whiskey. Every precaution was taken to prevent the disease attacking the stump. He was washed from head to foot with soap and water, afterwards with water containing a small portion of liq. sodæ chlor.; he was dressed in new clothes and placed in a large, well ventilated room, in a new bed and bedding. A nurse was specially detailed to attend him, no other being allowed to enter the room.

The wound was dressed with cold water, in which there was a tablespoonful of liq. sodæ chlor. to the quart. He slept well the first night, was cheerful next day, and has continued so up to the present time. He took a pint of porter the day following the operation, also a grain of opium three times—morning, noon, and night. If the last pill did not produce sleep, I gave thirty drops tr. opii at 9 P. M., after which he rested well. On the 3d of Feb. he was seized with nausea and vomiting, which yielded to a hard opium pill every two hours and dry treatment, that is, no fluids were given him. He continued cheerful and to improve until the 11th, at which time the stump began to swell and assume a threatening appearance; it was enveloped in a large flaxseed poultice, and on the 12th discharged a large amount of healthy pus. The poultice was continued until the 14th, when the inflammation subsided, since which time it has been dressed with tepid water and the patient has continued to improve up to the present time, Feb. 28th, and is in a fair way to recover. His food has been the same after the operation as before it; the stump has nearly healed; all the ligatures have not come away as yet. He is walking about his room, and will get well. March 3d.

Case 2. E. Nicholas, Co. E, 94th N. Y. Vols., aged 21 years, was admitted on the 11th Jan., 1863, was wounded at the same place and same date as Larke, arrived in the New York, had a gunshot wound of

the right side of the thorax and right side of the head. Wounds presented the ordinary appearance they do a month after their reception Gangrene attacked the wound of the thorax on the 14th Jan. Nitric acid was applied to the wound and around the edges on the sound skin, the poultice of charcoal, meal and yeast was applied and renewed every five hours. He took a grain of opium three times a day, also half a pint of porter twice daily; his food consisted of beef-tea, chicken broth, farina with milk, rice, custard, &c. He also took a half fluid drachm of fld. ext. cinchonæ thrice daily. The gangrenous spot was oval, three and a half inches long by two and a half wide, and emitted an intolerable stench. The constitutional disturbance was very slight, tongue clean, skin cool, pulse 90, bowels rather constipated, and very little appetite. He was of a lymphatic temperament. Dr. Stovell, Act. Asst. Surgeon U. S. A., having been deputed to take charge of all the gangrenous cases, he was transferred to the Naval Academy Hospital, Feb. 7th, 1863. I learn he has since died. He was confined in the Libby Prison Hospital, as were all the patients who were admitted into this hospital with wounds 11th Jan. 1863. The disease was progressing unfavourably, when he was transferred from my wards.

CASE 3. Theodore Bixler, Co. F, 11th Pa. Reserve Corps, aged 19 years, lymphatic temperament, was admitted precisely under the same circumstances as Nichols. He had a gunshot wound of the right side of the thorax. Gangrene appeared on the 14th of Jan.; it advanced in its course until the wound was two and a half inches long by one and a half broad, at the point of exit, and there was a circular patch an inch in diameter at the point of entrance. The same treatment was pursued in this case as in the others, with the exception that tr. iodinii was applied to the diseased surface, as it began to assume a healthy aspect, and with a decided benefit to the patient.

*Feb.* 4. The wound is healthy, and the patient evidently gaining flesh; is dressed with sol. argenti nit., four grains to the ounce.

24*th*. Granulations have filled up the wound, and it is cicatrizing; it is dressed with sol. argenti nit., ten grains to the ounce; no constitutional symptoms, and the patient will be well in a few days. The constitutional treatment was the same as in the above case.

CASE 4. W. H. H. Baily, Co. F, 38th N. Y. Vols., aged 20 years, lymphatic temperament, was wounded at the same battle, and was received under the same circumstances as the above-named. He had a gunshot wound of the shoulder, the ball passing, or rather grazing, the upper edge of the pectoralis major muscle, about an inch and a half from its insertion into the anterior ridge of the bicipital groove of the os humeri, and coming out at the outer edge of the scapula. The wound was to all appearances healthy when admitted. Gangrene appeared on the 15th of Jan.; the tissues instead of detaching themselves in brown or black sloughs, melted into a thick, light gray grumous matter. The constitutional symptoms were of a typhoid character. The tongue was dry, brown, and cracked, pulse varied from 120 to 130 per minute, and very feeble; no appetite; bowels irregular, sometimes loose, at other times constipated; restless at night. The local and constitutional treatment were the same as in the above cases.

*Feb.* 1. The wound has sloughed to such an extent as to expose the upper and outer portion of the great pectoral muscle to such a degree, that the pulsation of the brachial artery can be distinctly seen, and the point of exit, which was entirely healed, had opened, and as the man lay on his back

the matter was discharged through this opening; the wound was three inches in diameter.

3*d*. I ordered the wound to be dressed with scraped lint saturated with a solution of nitrate of silver, thirty grains to the ounce, and on the 5th the wound had assumed a more healthy appearance. On the 6th he was transferred to the Naval Academy Hospital much improved. He is now, I believe, in a fair way to recover.

CASE 5. E. M. Curry, Co. H, 1st Pa. Reserve Corps, aged 25 years, was received with the above-named patients. He was wounded in the right forearm. Gangrene appeared on the 16th January, and spread until the tissues sloughed to the extent of two inches long by one and a half broad. He had nitric acid applied, followed by charcoal and meal poultice. On the 1st Feb., the wound was much improved, and tr. iodinii was applied with advantage to it. He had no constitutional irritation, tongue clean, pulse natural, bowels regular; his food and medicine were the same as in the above cases.

28*th*. The man is nearly well.

CASE 6. Chas. Booyer, Co. H, 1st Pa. R. C., aged 22 years, was admitted the same date from the same source, with gunshot wound of the left forearm. Gangrene attacked the wound on the 16th Jan. He was treated precisely as the last-named, and continued to improve until the 17th Feb.; then gangrene attacked the wound with more violence, and the skin and subcutaneous tissues sloughed to the extent of two inches. The gangrenous spot was circular. As the pain was severe, and the slough, which had not separated, was of a spongy character, I made a crucical incision which afforded the man immediate relief.

21*st*. Not much improvement. Patient has no appetite; does not sleep well. I ordered him tr. ferri chlor. gtt. xxv., quin. sulph. gr. i, three times daily, with tr. opii gtt. xxx. at bedtime.

25*th*. Patient better, appetite improved; this man complains of more pain than any of the others.

28*th*. Still improves; he has had no constitutional irritation; his tongue was clean, pulse regular, and of sanguine temperament. He will recover.

CASE 7. N. Richards, Co. A, 94th N. Y. Vols., aged 21 years, was admitted the same date as the others, received from the same source, had a gunshot wound of the left thigh. Gangrene made its appearance on the 16th Jan.; tongue clean, bowels regular, appetite good, pulse natural, and slept well. Applications of nitric acid and poultice produced the desired effect. The wound speedily assumed a healthy appearance, granulated, and is now, Feb. 28th, cicatrizing. The wound was oval, and one inch and a half long by an inch wide. It was a slight case.

CASE 8. Chas. Housman, Co. B, 121st Pa. Vols., aged 33 years, was admitted on the same day as the above-named patients, had a gunshot wound of the right shoulder. Gangrene attacked the wound Jan. 15th; the disease progressed rapidly until the 1st of Feb., at which time the deltoid muscle was exposed in front to the extent of four inches, and one inch behind; the gangrenous patches were circular, and had the peculiar offensive odour. This was one of the worst cases in my ward. The patient was a stout, healthy man, with a cheerful disposition, pulse regular, tongue clean, bowels regular, good appetite, and slept well. He was treated with nitric acid and poultice with the most beneficial results. On the 4th of Feb., the dis-

eased surface had assumed a healthy appearance, and suppuration and granulation went on favourably until Feb. 20th, at which time he was transferred to Philadelphia. During the last week of his treatment the wound was dressed with sol. argenti nit., thirty grains to the ounce. He was to all intents and purposes well when he left; constitutional treatment was the same as in the other cases.

CASE 9. James B. Kent, Co. B, 19th Mass. Vols., aged 46 years, lymphatic temperament, wounded at Fredericksburg in the right popliteal space, admitted the same date from the New York. Wound was nearly healed when he arrived. Gangrene made its appearance Jan. 26th, and spread rapidly until the gangrenous patch was four inches in diameter. Nitric acid and the poultice steadily applied overcame the disease, and on Feb. 4th the character of it had altered very much.

*6th.* He was transferred to Naval Academy Hospital in a fair way to recover. He had but little constitutional irritation.

CASE 10. William Ham, Co. E., 5th Pa. R. Corps, aged 28 years, was admitted from the New York, on the same date with a gunshot wound of the left leg, fracturing the spine of the tibia. Gangrene appeared January 15th, soon destroying the tissues to the extent of three inches in diameter and exposing the anterior tibial group of muscles, also destroying the cellular tissue between them. The treatment was the same as in the above case, with the exception that on the third day I substituted tr. ferri chlor. for nitric acid and continued it until 20th; it had no beneficial effect. Nitric acid was again applied until 25th, when the disease changed for the better.

*26th.* Was painted with tr. iodinii three times daily and poultice continued. He improved until the 6th February, when he was transferred to the Naval Academy Hospital. He had no constitutional irritation.

CASE 11. M. S. Dunn, Co. K., 1st Pa. R. Corps, aged 23 years, was admitted Jan. 11th, from the New York, with a gunshot wound of the posterior portion of the thorax; the ball entered the left side at the inferior angle of the scapula and came out near the same place on the right side. Gangrene appeared at the exit of the wound on the 14th and at the entrance two days after. The parts at the exit sloughed to the extent of four inches in diameter and at the entrance half that space.

*Feb.* 10. The application of nitric acid and poultice with the same constitutional treatment, has destroyed the specific character of the diseased parts, and he is rapidly recovering.

*15th.* Wound perfectly healthy; it is dressed with sol. argenti nit., 10 grains to the ounce.

*27th.* Wound cicatrizing rapidly, treatment continued. Although this was one of the worst cases, there was not the slightest constitutional irritation.

CASE 12. J. T. Gibson, Sergeant Co. A., 25th N. Y. Vols., aged 28 years, admitted the same date as the others from the New York, had a gunshot wound of the forearm, fracturing the lower third of the ulna. Gangrene attacked the wound Jan. 16th; the same treatment was pursued as in the other cases.

*Feb.* 6. He was transferred to Naval Academy Hospital in a fair way to get well. No constitutional disturbance.

CASE 13. Aaron Bush, Co. G., 10th Pa. R. Corps, aged 23 years, admitted the same date, and from the same boat, with a gunshot wound of

the right side of the thorax. Gangrene attacked the point of exit Feb. 2d, and spread rapidly, destroying the tissues for a space of two and a half inches long by one and a half broad.

*Feb.* 12. Disease has yielded to application of nitric acid and poultice.

20*th.* Wound perfectly healthy, dressed with sol. argenti nit., 10 grains to the ounce.

28*th.* Wound cicatrizing and will soon be well.

CASE 14. Geo. F. Knowlton, Co. F., 4th Maine Vols., aged 24 years, was admitted Jan. 11th, from the steamer New York, with two gunshot wounds of the right side of the body; one ball entered two inches above the crest of the ilium and passed out two inches from the spinal column opposite the second lumbar vertebra, the other three inches above the first, and passed out four inches from the spine; the course of the latter ball was parallel with the former. Gangrene, which was of a mild form, attacked the wound Feb. 12th, and destroyed the skin and subcutaneous tissues for an inch and a half, also burrowed to a considerable extent, discharging a thick, grumous matter, like Baily (Case 4th). Nitric acid and poultice were applied with marked effect.

25*th.* The wound discharges less freely; that part of it, with which the poultice comes in contact, is healthy; injected with sol. argenti nit., 30 grains to the ounce.

*March* 2. Wound nearly well, patient will recover; no constitutional disturbance.

CASE 15. Henry M. Wick, Sergeant Co. A., 8th Pa. R. Corps, aged 23 years, was admitted into this hospital from the Naval Academy Hospital Sept. 15th, 1862, with a gunshot fracture of ilium near the crest.

*Nov.* 28. I cut down upon the bone and extracted a piece of it, necrosed, about the size of a small hazel-nut. The incision healed by first intention; the wound was granulating rapidly, when it was attacked by gangrene.

*Feb.* 3. The cicatrix of the wound was destroyed in forty-eight hours; the incision opened from one end to the other and became deeply excavated. Nitric acid and poultice speedily restored it to a healthy condition.

20*th.* Applied solid nitrate of silver.

*March* 2. Patient nearly well; no doubt of his recovery. This was the only man who had gangrene and did not come in the New York, Jan. 11th, 1863.

*Remarks.*—That the disease was brought from Richmond I have not the slightest doubt; the want of proper space, medicine, and disinfectants, to treat a large number of wounded, would be a prolific source from which we might expect a disease of this nature, to say nothing of overcrowded and badly ventilated wards. It no doubt was concealed as long as possible in Richmond, but is now well known there. Our officers bring accounts of it, and no doubt the cargo of the New York was the first souvenir we received from the rebel hospitals.

There were evidently two varieties of it, that in which the tissues melted rapidly into a light gray grumous matter, which would be found in the bottom of the wound; and the other in which the tissues were converted into a brown or black dry slough, which required in some instances to be

dug out with a blunt instrument. This had to be done invariably before the application of the acid.

This gangrene was, in the majority of cases, of a mild form, and though it presented all local symptoms of the disease as described by Hennen, yet the constitutional were, as a rule, absent. The wounds were dry and hot and the limbs were much congested when it existed in them. The edges were swollen and everted, and sanies issued from them when the wound was of the black or brown variety. The first indications of improvement were alteration in the character of the discharged fluid, a disposition of the sanies to assume qualities of healthy pus, and the wound to become moist; these may be looked upon as invariably favourable. If these men had been crowded together in badly ventilated wards and nurtured by filth and food of a bad quality and insufficient in quantity, I have no doubt but that it would have assumed all the malignant symptoms of the disease as described by the above named writer. Every precaution was taken to prevent the spread of it from patient to patient; as soon as it made its appearance in a wound, the patient was immediately removed and placed in a room where there were no wounded. As I had many sick I placed these men in rooms with them, one to each room; those with healthy wounds were removed to another building; although I was obliged, for want of room, to retain many wounded in the same building with those infected, the gangrenous patients produced no bad effect upon the others. Each man had a separate sponge, basin, &c.; one nurse was detailed in each ward to dress the wounds of gangrenous patients, and he allowed to dress no others; the bedclothes were washed separately, and whitewashing the room was frequently and thoroughly done. The constitutional treatment was never lost sight of, roast beef and potatoes, beef-tea, chicken broth, eggs, milk, rice, much porter, bark, and opium were given freely with the most decided advantage. Those who were attacked last had it in its mildest form, and though wounds of some patients were disposed to assume an unhealthy character at first, they are at present all doing well; the gangrene may be looked upon as a disease that was, and the patients now all have healthy wounds.

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ART. VII.—*Report of Cases of Hospital Gangrene, treated at St. John's College Hospital, Annapolis, Md.* By Act. Asst. Surgeon H. O. CRANE.

CASE I. Herman Tiarnor, private of Company F, 32d Indiana Volunteers, wounded at Murfreesborough, Tenn., Dec. 31, 1862, by a minie-ball passing through the latissimus dorsi of left side, over and exterior to the eighth rib, entering posteriorly. Patient was twenty-seven days in Libby Prison at Richmond, Va.; arrived here per steamer New York and was admitted Jan. 29, 1863, at which time the wound at the exit of the

ball was in a sloughing condition, and within twenty-four hours thereafter manifested all the symptoms of hospital gangrene. Constitutional symptoms present. Headache, nausea, quick pulse (130). Hot skin, with occasional rigors. Nitric acid was applied to the surface of the wound, and subsequently poultices of charcoal and yeast with chlorinated washes, and dressed twice each day with tinct. ferri chloridi.

*Feb.* 5. Ulcer looking more healthy; sloughing has ceased; dressings, solution of tannin, gr. xx, aqua ℥j; poultices continued. Constitutional treatment, sesquioxidi ferri, quiniæ sulphas, bark, porter, beef-tea, and nourishing diet.

20*th*. Patient improving and treatment continued.

28*th*. Patient now well.

In the above case, the constitutional symptoms had preceded the unhealthy condition of the wound, though the application of the fuming acid arrested to a great extent the spread of the ulcer, yet the continued application of tinct. ferri chloridi was of marked benefit.

CASE 2. Private J. Loose, Company B, 5th U. S. Infantry, wounded at Murfreesborough, Tenn., Dec. 31, 1862, by a minie-ball passing through upper third of the tibialis anticus, and carrying away the spine of the tibia, having entered posteriorly. Patient arrived here from Richmond, Va., on the steamer New York, Jan. 29th, 1863, and was on that day admitted into this hospital. On admission, the wound was in a sloughing condition with extensive fetid discharges. Local treatment, constant application of lint saturated with tinct. ferri chloridi and free use of liq. sodæ chlor. injected into the wound.

*Feb.* 5. Sloughing arrested; granulations looking healthy. Local treatment continued. Constitutional treatment as in the above case.

18*th*. Patient still improving; treatment continued.

28*th*. Wound healed. The history of this case also shows that constitutional symptoms preceded the gangrenous condition of the wound.

CASE 3. Theodore Adams, private Company E, 21st Illinois Volunteers, wounded at Murfreesborough, Tenn., Dec. 31, 1862, by a musket-ball entering posterior portion of the deltoid muscle of the left arm, and traversing the trapezius muscle, making its exit near the spine. Patient arrived in steamer New York, Jan. 29, 1863, and was on that date admitted to this hospital. On admission, the wound looked well, though suppurating freely. Patient much debilitated, tongue dry, pulse 120 and quick, headache, diarrhœa and total loss of appetite. Ordered beef-tea, milk-punch, brandy-mixture, tinct. ferri chloridi gtt. xxv every four hours; also quiniæ sulphas, gr. iv every six hours, under which treatment the patient improved.

5*th*. Pulse one hundred, skin and tongue moist, and appetite returning. Condition of the wound the same.

8*th*. Constitutional symptoms the same, but the wound has become painful, and is commencing to slough; fetid discharges, &c. Applied poultices of charcoal and yeast with chlorinated washes.

10*th*. Sloughing continues; wound is injected with Labaraque's solution, full strength, repeated every six hours; poultice continued.

12*th*. Condition of the wound unimproved. Ordered dressings of tinct. ferri chloridi; poultice removed and liquor sodæ chlorinatæ applied.

14*th*. Wound commencing to granulate, discharge less profuse and more

healthy. Constitutional symptoms improved; continued dressings of tinct. ferri chloridi.

*18th.* Wound granulating freely; appetite good.

*28th.* Wound nearly healed, and patient will be well in a few days.

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ART. VIII.—*Circumscribed Aneurism of the Walls of the Left Ventricle.* By PHILIP S. WALES, M. D., Surgeon U. S. N.

JOSEPH BROWN, ordinary seamen, age 25, born in Malaga, was admitted into the Hospital at Portsmouth, Va., Dec. 24, 1862, from the steamer Rhode Island. He was nearly comatose, and unable to speak or give any intelligible signs of his sufferings. The surgeon of his ship sent with him the following account of his case: "Admitted to my list Dec. 12, complaining of headache and pain in the back, with chills and cough. He improved and was discharged, Dec. 15. On the 20th of the same month again presented himself, having a cough and great difficulty in articulating properly. In the afternoon he had a chill, and another on the following day, at the same hour, succeeded by the usual phenomena of intermittent fever. Was put upon the use of the sulph. quini. During the morning of the 23d seemed comfortable; in the evening fell from his hammock convulsed, breathing short and hurried; pulse 102; semi-comatose." It is well to observe that the ship was in service in the James River, where malarial diseases are rife.

Immediately on his being made comfortable in bed, the following receipt was ordered: R.—Ammoniæ carb. gr. xx; whiskey f℥iij; vitell. ov.; sacchari albi ʒij; aquæ f℥ij.—M. Quarta pars quàque duo horâ.

*25th.* No improvement; pupils contracted; conjunctivæ insensible, with mucous threads collected upon them and on the edges of the eyelids. The corneæ dull and glassy in appearance; pupils motionless and about as large as ordinarily; the right eye convergently, and the left divergently strabismic, and both well turned up under the lids. The face and lips of a dusky or bluish color. No heat of scalp, nor were any motions made by the patient to direct our attention to any suffering on his part in the head. Tongue covered with a thin yellowish coating; mouth moist, and when the medicine was placed into it, several seconds elapsed before deglutition commenced, unless it was thrust well back with a spoon. Towards the last he made attempts to eject the mixture with his tongue. Bowels obstinately constipated, and have resisted the free use of stimulating enemata and drastic purgations.

*26th.* Continues pretty much in same condition; occasionally, when spoken to loudly, stammers out "better," and when asked to do so, attempted

to protrude his tongue. Respiration 20; pulse 82, and normal in volume, with some increase of hardness. Coarse mucous râles can be heard over every part of the chest, before and behind. Healthy resonance on percussion. Cardiac dulness increased in its area, extending to the left side. Evening. Patient restless, tossing about in bed, throwing off the coverlids and keeping his limbs in constant motion. Passes his urine unconsciously, freely, and in larger quantities than normal, keeping the mattresses constantly saturated with that secretion. Skin soft and moist, and sometimes the perspiration stands out in large drops upon his forehead and chest. Applied counter-irritant to chest; enema of sulph. magnes., and continued the mixture of egg and whiskey.

*28th.* Has been failing; tongue brown, lips covered with black sordes; jactitation, facies hippocratica; death.

*Post-mortem 14 hours afterwards.*—Rigor mortis well developed, hypostatic congestion in back and hips. *Head.*—Strong adhesions between skull and dura mater; veins of pia mater gorged with blood. Two or three superficial patches of red softening on the cerebrum, and the gray substance of a few sulci yellow from purulent infiltration. Arachnitis with delicate threads of lymph in some places. The anterior and middle lobes of the cerebrum normal in appearance, posterior left lobe broken down by red softening and suppuration. Left lateral ventricle contained about three ounces serous fluid, with flakes of lymph enlacing with the choroid plexus, and partially covering its floor; right lateral ventricle healthy. Cerebellum entirely exempt from any pathological changes. Under pons varolii and medulla oblongata there was a purulent foyer, of about two or three drachms of pus between the layers of arachnoid. The sub-arachnoid spaces contained an unusual amount of serous fluid; spinal cord, natural firmness and structure. In many places the arachnoid was thickened and covered with easily lacerated filaments of fibrin. The volume of brain seemed reduced so that there was a considerable space between it and the calvaria. *Chest.*—The lungs were of a deep brownish-red colour everywhere, except at the anterior margins of the upper, right, and middle left lobes, which parts were healthy. They crepitated between the fingers; at few points lobular pneumonitis had occurred, and a section through the consolidated tissue presented all the physical characters of carnification. From cut surfaces, a frothy whitish fluid exuded—that from the larger divisions of the bronchial tubes was muco-purulent. In fact the usual pathological changes of acute bronchitis were observed. The pleuræ were perfectly healthy in appearance, and contained about it a half ounce of serous fluid. *Heart.*—While in situ, this organ appeared of enormous size, and, grasped in the hand, conveyed the impression of its being double. Slitting up the pericardium gave issue to about two ounces yellowish serum, and displayed the heart with its cordiform aneurism in such a striking manner, that the exclamation of some of the bystanders was, "The man has two hearts."

The coagula were removed from both, and the organ weighed 18 ounces Avoird. Adipose tissue covered in the external surface of both ventricles, except at their apices, the muscular fibres beneath presenting a pale waxy appearance, while those of the auricles were of a healthy reddish colour, and distinctly aggregated in strong bands. The pericardium adhered to the apical segment of the aneurism.

In the right ventricle yellowish filaments of fibrin entwined with the fleshy columns and the cords, and connected themselves with a large mass of the same material adherent to the columnæ carneæ. Loosely in its cavity were the almost black, post-mortem coagula. The tricuspid and pulmonary semilunar valves were perfectly healthy, and accurately shut their respective orifices. Cadaveric coagula were also found in the right and left auricles, but none of the yellowish deposit. The peculiar semi-organized yellow clots were found in the left ventricle, also adherent to the columnæ carneæ.

When the cavities of the heart were cleared of all these deposits, an incision was made from the left ventricle into the aneurism, exposing its cavity freely, and giving a good view of its mouth and the hypertrophied columnæ carneæ, which subtended it, dividing the area into an upper smaller segment, and a lower larger one.

The soft black cadaveric coagula were first turned out from its centre, then less dark granular matter, and lastly layer after layer of reddish-yellow, pinkish, or flesh-coloured fibrin was peeled out, like the laminæ of an onion can be separated after the removal of a section of it. It was distinctly organized; and close to the outer rind, I observed tender capillaries shooting into it. Outside of all this was a hard calcareous case forming a complete wall for the aneurism, except at its orifice and apex, where there were two round holes, the former 18 lines and the latter nearly an inch in diameter in the shell; there was also a bulging of the extreme point somewhat beyond the lower opening, making in this manner a small secondary cavity. This lining had the thickness of two lines nearly everywhere over its surface, and was perforated at numerous parts by small holes. In its physical appearance, it resembled closely thin plates of the dense cortical substance of the thigh bone; my microscope not being accessible, I am unable to give its minute structure. Outside of this was met the muscular structure of the heart, rather what was left, which only amounted to a thin layer of fibres, placed between the calcareous envelope and the pericardium, diminishing in thickness to the dilated apex that I have previously mentioned, where it ceased, the thickened pericardium forming with the fibrous clots the only boundary of the aneurism in this direction and corresponding to the lower opening of the inside crust. The thickness of these two layers permitted the rays of light to pass through them in such quantities, when the heart was held between the eye and the sun, as to constitute translucency. As I have said above, the heart was perfectly symmetrical, and

if the aneurismal tumour had been cut from it, through its somewhat narrowed neck, the organ would have been, pathologically, only concentrically hypertrophied and affected with fatty degeneration. The mitral and aortic semilunar valves, like their fellows on the opposite side, were in a normal condition, and performed their offices healthily. I took the following measurements of the left ventricle walls :—

| | | |
|---|---|---|
| | At the base . . . . . . | 9 lines |
| | middle . . . . . | 8 " |
| | apex . . . . . | 5 " |
| Right Ventricle. | At origin of pulmonary artery | 2 " |
| | lower down . . . . | 3 " |
| | ventricular septum between 7 and 8 | " everywhere. |

Immediately under two of the aortic semilunar valves, and corresponding to that part of the left wall of the right ventricle against which the inner segment of the tricuspid valves lay, when open, the partition was diaphanous, and resembled exactly in structure and thickness the membranous diaphragm of the foramen ovale of the auricles.

| | |
|---|---|
| Capacity of left ventricle . . . . . . . . | ℥j. |
| " " right ventricle . . . . . . | little less. |
| " " right auricle little over . . . . . | f℥j. |
| " " left auricle little under . . . . . | f℥j. |

The aneurismal pouch cleared out, as I have said, held exactly 4 ounces of alcohol.

In regard to the walls of this cavity, I have already stated that at the point of it, the pericardium alone formed its wall. From this place the muscular tissue increased in thickness towards the base of the tumour, where it had attained six lines close to the margin of the ventricular orifice, which was surrounded by a strong fibro-cartilaginous ring seated about the middle of the left cardiac margin (*margo obtusus*) and a section of it presented a triangular shape with its base outwards, and the two angles continuous either way with the parietes of the ventricle on the one hand, and that of the sac on the other, its apex bounding the orifice with a rounded margin. Between the first two angles there was a distance of 21 lines, and between the last and a point midway the base of the fibrous circlet 18 lines. From this orifice the walls of sac spread out behind to the ventricular fissures, and anteriorly midway between the anterior fissure and left border upwards to the base of the left auricle and inferior vena cava, the apex projecting an inch and a half below that of the heart. From the situation of the communicating orifice its upper half must have been covered by the mitral valves, when they flapped back in the ventricular diastole.

From the preceding history it will be seen that this is an extremely interesting and unique case, and may be regarded as a true circumscribed aneurism of the ventricular wall, corresponding to similar diseases seated in the aorta, from fatty degeneration. Though it certainly possessed the re-

markable peculiarity of having a complete calcareous coating or layer, which I am not aware has been described to be ever possessed by the latter disease, yet I can readily imagine that this might be the condition of any artery undergoing degeneration of its tissues. The present disease, undoubtedly, began at an early period and always escaped notice, as happened in the case of the celebrated French tragedian Talma, who, it is stated, died of a partial aneurism of the parietes of the heart, which was revealed by dissection, though during life no signs had announced its presence. In this man there were no abnormal signs except an extension of cardiac dulness to the left side, which could hardly have indicated anything beyond hypertrophy or dilatation.

The two other diseases, bronchitis and arachnitis, with cerebral softening and suppuration, were undoubtedly dependent upon the heart-disease, and were the immediate causes of death.

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Art. IX.—*Case of Premature Labour Artificially Induced.* By G. Moehring, M. D. and J. K. T. Van Pelt, M. D., of Philadelphia.

Equal in value to the discovery of a new therapeutical remedy is the safe and successful performance of an advised or theoretical manipulation in surgery or in surgical obstetrics. Hitherto, the absence of a reliable and harmless oxytoxic for inducing premature labour, unattended by danger to both mother and infant, was a want that has been greatly felt by obstetricians who have been consulted for that purpose; and it is, therefore, with a considerable degree of triumph and satisfaction, that Dr. Moehring and myself are enabled to add the following case to the recorded list of those labours which have been successfully accomplished by the process of that skilful accoucheur, Mr. Cohen, of Hamburgh. Cohen's method was an improved plan which followed the vaginal warm water douche of Kiwisch, being the same which Schweighauser, in 1825, proposed, viz., to inject water into the cavity of the uterus, the fluid being made to pass between the internal surface of that organ and the fœtal membranes. It is this operation which, from the ease with which it can be performed and controlled, we desire to advocate and recommend to the profession. That caution will necessarily always be required we need not enjoin. Fatal consequences may result from a too sudden dilatation of the cervix and os from the enormous fluid pressure contusing or rupturing the lower portion of the uterus, or else stretching the imperfectly developed uterine fibres beyond the power of reaction, causing paralysis or the separation of the placenta, or allowing the water itself or air sucked up with the fluid to be injected through the uterine veins and sinuses, and thus introduced into the circulation. There

is also the liability of forcing the water through the Fallopian tubes into the peritoneum. All these perils, noticed by Scanzoni, Guillier, Professor Simpson, and other eminent accoucheurs, are to be apprehended, and most carefully guarded against. Again, the amount of water to be injected is a very important consideration; when excessive, it has altered the presentation of the fœtus, as in the two cases noticed by Dr. Priestley, in one of these, causing the pelvic pole to take the place of the cephalic; the cause of this accident was the abnormal distension of the lower segment of the uterus, by so large a bulk of water, altering the ovoid form of that viscus and occasioning thereby such results.

Mrs. Z., the patient who was the subject of the operation, had resided for several years in New York. The physicians who conducted her delivery there in her first accouchement subsequently induced artificial labour in her fourth, fifth, and seventh pregnancies.

The history of each labour was very accurately stated by herself and husband, which was as follows: She was married at nineteen, and miscarried at the third month of her first gestation; again becoming pregnant, she fell into labour the ensuing fall, being then twenty years of age; this parturition was characterized by sufferings of a most intense and agonizing severity. It continued three days with some intervals of cessation. The presentation was cephalic, and the child was extracted by the long forceps. It was a male, and stillborn; the bi-parietal and bi-malar diameters of the cranium were pronounced by the medical attendants as unusually great. A miscarriage at the seventh week preceded the second child, which was prematurely delivered at the thirty-fifth week by the use of the sponge tent and the colpeurynter; it presented by the feet; the labour lasting from 2 P. M. until 8 P. M., no forceps assistance was required; the child was a female, and stillborn. The same method of premature labour was employed the following year to deliver a second female child at the thirty-second week, and again presenting by the feet; severe pains, lasting one hour only, accomplished the birth of a *living* infant, but some defect of its rectum or anus was assigned as the cause of its death, which occurred three days after. At the close of another year, the gestation of the fourth child being allowed to run out to term, labour began spontaneously, but becoming protracted, and her pains acutely distressing, while the head, from its impaction, was unable to advance, her medical attendant performed version by the feet. After the exit of the child's body the fœtal cranium became wedged in the pelvis, and to assist its descent, the blunt hook was inserted into the child's mouth, but the great tractive force employed breaking the jaw, it was then placed in the orbit, thus effecting the birth of the infant, a male, and stillborn; this labour lasted from 6 A. M. until 9 P. M. The fifth child, a female, and also stillborn, was prematurely delivered at the thirty-first week by the same method as the preceding; it presented by the breech, her labour lasting twelve hours;

the death of the infant was due from neglect to extract the head from the pelvis by timely instrumental interference, as stated by the parties.

From the foregoing narrative, it is seen that the three female children were pelvic presentations, and the males cephalic, and also that the conceptions followed so rapidly and immediately that her deliveries took place annually. The methods employed were also attended by great detriment to the health, as they occasioned severe attacks of dysuria, profuse menorrhagia, leucorrhœa, ulceration, and abrasion of the internal and external os; it was in this exhausted and weakened state of the constitution, attributable mainly to the modes thus used, that she again became enceinte, removing to Philadelphia for attendance here.

The first investigation of the dimension and shape of the pelvis was made by Dr. Moehring and myself, December 14th, being a careful, external, and vaginal measurement; and that the diagnosis should prove clear and positive, a repetition of the examination was made on three subsequent occasions. Our conclusions were, that the pelvis was eminently rachitic, that condition which Busch, of Berlin, a most able German writer on obstetrics, describes as resulting in early youth from an arrest of development in the lower limbs, as also in the transverse and ascending rami of the pubis, while the ossa ilia, upper body, the bust, and upper limbs, attain a natural growth; he states that this arrest ceases, however, but at a period too late to overtake or attain to an equality with the more favoured portion of the frame. This condition was well exemplified in our patient by the contraction of her superior strait; the length of whose conjugate or sacro-pubic diameter was judged to be but three inches, involving an elevation and advance of the promontorium, besides an abnormal approach towards the os pubis, and this view was further strengthened by the unnatural concavity of the sacrum visible externally while the diminutive lower limbs and well expanded chest clearly stamped the case as belonging to the order described by the authority mentioned. The inclination of her pelvis was unusually great. At our last interview, the partly expanded cervix could be easily touched, its tissues and the os were felt to be soft and capable of entrance. The peculiar dangers attending the modus operandi proposed, were now fully stated to the lady and her family, but the vivid recollections of her sufferings from the former manipulations induced them gladly to accept a proceeding that offered any chance of less distress, especially as it increased the probabilities of the delivery of a live infant. It was determined to induce labour at the thirty-second week, but upon further consideration this was deferred until the *thirty-third* week, from our extreme anxiety to favour the child's existence, not regarding the delay of a few days as in any way impairing the usefulness to the mother of the method advised.

The instruments employed for the operation were two No. 7 very smooth, flexible, gum-elastic male catheters, the vesical end of each termi-

nating for half an inch in a silver tube, with a perforation at the extremity, in addition to the lateral openings; to prevent the stilet protruding from any of the orifices, the wire was passed through a piece of cork one-fourth of an inch thick, as far as its ring, before inserting it into the catheter. thus avoiding any risk of its projecting point lacerating the membranes or uterus. The injecting apparatus used was the common hydrocele injecting bag, capable of holding five ounces, its nozzle made to fit accurately the catheter, and provided with a reliable stopcock.

It was agreed to induce labour on Monday, the 9th day of March, at 10 A. M., but a slight attack of indisposition occurring on the Sunday before, it was deemed prudent to postpone all interference until Tuesday, March 10th, on which day the operation was begun at 11 A. M. The bladder and bowels having first been fully evacuated, the injecting bag was carefully filled with water at a temperature of 70° Fh., until its surface came to a level with the edge of the extremity of the nozzle, hence insuring all absence of atmospheric air from this instrument. The patient was placed on her back, bringing down the hips to the edge of the bed, as in the usual obstetrical position for instrumental accouchement. The finger was now introduced within the os uteri to direct the catheter; and that instrument containing its stilet, so bent near its vesicular end as to assume a curve considerably less than that of the male sound, was well lubricated, and slowly and with great gentleness passed up into the cavity of the uterus, between its inner surface and the fœtal membranes. It passed in on the right side and advanced towards the front uterine wall, without our experiencing the slightest resistance; on withdrawing the stilet cautiously a few drops of blood escaped, proving that the catheter in its passage had separated the membranes from their adhesions with the womb. To measure how far the tube had penetrated within the organ, the second catheter was inserted within the vagina, until its extremity rested against the os, and then placing both in juxtaposition, the amount of separation of the two manual ends of each catheter indicated exactly the distance the first had entered, in this case shown to be five inches. Attaching the nozzle of the injection bag, five ounces of water was gradually injected; of this quantity a teaspoonful, only, escaped. The catheter was allowed to remain a few minutes and was then withdrawn; the only effect observable was the production of a drawing feeling about the abdomen, and a dragging sensation in the back. This speedily disappeared, and as soon as the patient became calm she was permitted to walk about her apartment, and we agreed to desist from further interference until nearly twelve hours had elapsed.

The interval of "twelve hours," Dr. Tyler Smith, who has followed this proceeding for several years, states as preceding the coming on of labour, and in his practice "labour was often not deferred as much as twelve hours from the time of using the injection, and generally it had commenced im-

mediately." Also the statistics of fifty cases that have been operated on in Germany by this means show, that in all, labour came on within twelve hours.

At 8 P. M. we found our patient moving about her room, having been entirely free from any pain or annoyance since the morning, the injected water had gradually drained off, and she pleasantly exclaimed, "Oh, this is too easy, you must cause me greater suffering; my nature cannot be so easily impressed, it is too strong to yield up a child so readily."

At our first injection we found it very difficult to reach the os, or retain the finger in it as a guide, as the extreme flexion of the thighs in the dorsal decubitus exerted so great a pressure against the overhanging abdomen as to lift the uterus out of the superior strait, thereby carrying the os almost beyond reach, and likewise causing painful cramps in her limbs. Abandoning this posture, she was now placed on her left side; the os was found unchanged, and the second injection was made in the same manner as the first, without the escape of the slightest quantity of water; the stilet was withdrawn, and in imitation of the practice followed in Germany, we allowed the catheter to remain, intending it to be retained until labour supervened, but in a few moments she complained greatly of a severe feeling of distension around the front of the abdomen and descending towards the back, assuming so violent a degree as to demand the speedy withdrawal of the instrument, when a total subsidence of the unpleasant symptoms followed, greatly relieving our anxiety. Shortly, however, she was seized with chilliness and shivering, cold feet, oppression at the chest, her eyes becoming somewhat sunk, pulse feeble and quick, all her symptoms simulating those of internal bleeding, but the application of artificial heat to the feet and body soon removed this collapsed condition. After remaining with her some hours we left for the night, having ordered Hoffmann's anodyne to be given in repeated doses, as also lime-water, for flatulence which was present. Meeting the following morning at 11 A. M., we found our patient had enjoyed perfect repose during the night, and had passed, just before our visit, some of the water with a clot of blood in it. On examination, we found the os further down, dilated about two inches, and its temperature, as well as that of the vagina, cooled, by the draining of the injected water, to a most remarkable degree below the natural heat of those organs; the finger could also be passed into the uterus around the membranes, and the child's head was plainly felt resting on the symphysis pubis. It was thought best to let her rest to-day undisturbed; an ounce of castor oil was ordered, and she was permitted to recruit her strength by using beef essence freely. This day was spent quietly, with perfect freedom from labour-pain, and at night she had a long and refreshing slumber.

On Thursday morning at 11 A. M., the condition of the patient being every way favourable, and no symptom of labour beyond the slight dilatation of the os being manifest, she was again placed on her left side and the

catheter carried within as before; five ounces of water were injected, which at first refused to flow from the bag, as if an impediment to its advance existed by the adhesions between the membranes and uterus, when suddenly, the obstacle being overcome, the water rapidly left the elastic bag, flowing between the membranes and womb, the greater portion returning into the vagina. Four ounces more were immediately injected, some of which soon escaped through the os. The motions of the child had been felt very strongly since the injection used the day before, and were now very active; the waters also were more tense, rendering a greater caution necessary in introducing the catheter, for fear of rupturing them prematurely. In two hours labour had become very strong, and as the membranes relaxed, the head was diagnosed to be in the first position of the vertex, but still resting on the transverse ramus of the pubis. By 2 P. M. the os was nearly dilated, the pains occurring every five minutes, and the head had descended into the brim, giving every indication of delivery in a short time. At 3 P. M. the os was entirely dilated, and she referred her pains chiefly to the lower part of the abdomen. As the advance of the head now seemed delayed, it was determined to evacuate the waters at 5 P. M. if no progress was perceptible; this was done. At 6 P. M. there was no further descent of the child, and placing her on the back, it was found to cause both the head and os to recede; a shortness of the cord was suspected as the cause of our delay. As the dorsal position seemed to lessen the strength of the pains, which also became fewer and further apart, it was found, on a trial, that a right or left lateral decubitus favoured both their strength and rapidity. She was therefore allowed to assume these alternately. By 8 P. M. the head evidently had moved from its stationary position towards the excavation encircled by the swollen os, though so loosely that the periphery of the opened cervix was not made tense or distended by the pains. At half-past 9 P. M., the head, sinking within the excavation, stretched the dilated os to its fullest capacity, when it was pressed up past the fœtal cranium by the finger. At 10 P. M. the birth of the infant was fully accomplished; it was a male, and opened its eyes, gasping and moaning immediately upon its exit from the maternal organs. The cord was unusually short, and was wound around its neck and left arm; from prudential motives we did not sever the connection between the placenta and fœtus until all pulsation ceased in the umbilical vessels. The placenta came away without difficulty or any hemorrhage. The measurement of the diameters of the head was made, giving for the occipito-mental, 5 inches; occipito-frontal, $4\frac{8}{16}$ inches; bi-parietal, $3\frac{11}{16}$ inches; cervico-bregmatic, $3\frac{11}{16}$ inches; its circumference was 13 inches.

The next day the nurse reported the condition of the child as every way satisfactory; it swallowed easily and eagerly its nourishment, and had several evacuations of meconium and urine; it was ordered to be kept permanently on its right side, and from its birth to the present date has been unusually exempt from the customary infantile indispositions.

The recovery of our patient was rapid; the lacteal functions were well established, and not one unpleasant symptom has appeared since her delivery; in three weeks she received her friends in her parlour, and is enjoying perfect immunity from all the female maladies which, for past years, have in combination been the harassing sequences of her puerperal state.

The New York physicians, in their statements to Mrs. Z., pronounced the conjugate diameter of the superior strait to be *less* than three inches. The careful measurements made anteriorly and subsequently to this labour, have confirmed our diagnosis of its length being *fully* three inches.

In support of the propriety of our treatment of this case, I shall quote here the instructions which Scanzoni has given in regard to the subject, as found at page 730 of his Lehrbuch Der Geburtshilfe. He there declares that, "on the authority of Marinus, Ritgen, Stoltz and Kiwisch, artificial labour must be employed when the dimension of the conjugate diameter of the superior strait is abnormally small," and minutely points out the time by the following schedule, viz.:—

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| When the | sacro-pubic diameter is | 2 | inches and | 6 or 7 | lines, | induce labour at the | 30th | week. |
| " | " | 2 | " | 8 or 9 | " | " | 31st | " |
| " | " | 2 | " | 10 or 11 | " | " | 32d | " |
| " | " | 3 | " | | | " | 33d | " |
| " | " | 3 | " | 1 | line, | " | 33d | " |
| " | " | 3 | " | 2 or 3 | " | " | 34th | " |
| " | " | 3 | " | 4 or 5 | " | " | 35th | " |
| " | " | 3 | " | 2 or 6 | " | " | 36th | " |

Scanzoni observes that the necessity of producing premature delivery may be argued from the fatality resulting to the children previously born, whether caused by the compression of their heads when excessive in volume, or by a contraction of the pelvis; this is conditional, however, as a subsequent child might be smaller, and with ease and safety pass through a diameter of three, or three and three-quarters of an inch. Further delay in the case of Mrs. Z. would have been imprudent, as a sudden and very rapid increase in bulk of the uterine contents very ostensibly took place at the thirty-third week. As it was, the tardy character of her labour towards its close gave us sufficient reason to believe that instrumental interference would be advisable if delivery was protracted beyond 12 P. M.; the development acquired by the child, from too long a postponement of the artificial induction of labour, would, without doubt, have required a forceps delivery.

A more expanded and detailed account of this case has been given than was first intended, and our limits prevent any comparison between Cohen's process and the various methods employed. The life of a child, the security and health of its parent, the credit of preserving and continuing male issue to the family, under a knowledge of the discouraging antecedents, are achievements which must strongly recommend the means employed by us with such signal success

# TRANSACTIONS OF SOCIETIES.

## ART. X.—*Summary of the Transactions of the College of Physicians of Philadelphia.*

1863. *Feb.* 4. *Report on Meteorology and Epidemics for* 1862.—DR. WILSON JEWELL read the following report:—

In offering my Annual Report on the Meteorology and Epidemics of our city for 1862, or in other words, on its hygienic condition and relative mortality, I would acknowledge our indebtedness to a beneficent Providence, for the good degree of health with which we have been favoured throughout the year.

METEOROLOGICAL RECORD.—The accompanying abstract of meteorological observations is furnished as usual by Prof. J. A. Kirkpatrick, A. M. His observations are made for the Smithsonian Institution. He has also added a comparative table of atmospheric phenomena for the last eleven years, for Philadelphia.

The mean temperature of the year 1862 was 53.58°, and stands one and one-eighth of a degree below that of 1861, and seven-tenths above that for eleven years.

The maximum temperature (95½°) occurred on the 7th day of July. The minimum temperature (8°) was on the 21st of December. The range of the temperature for the year was 87½°.

The warmest day of the year was August 9th, when the mean of the thermometer stood 87.67°. The coldest day was December 20th, when the mean for the day was 15.83°.

The maximum pressure of the atmosphere (30.555 inches) occurred on Nov. 16th; the minimum (29.216 inches) was on February 24th. The mean of the barometer for the year was 29.846 inches, which was a fraction lower than for 1861, and for the average of eleven years.

The force of vapour was less than for 1861, and for the average of eleven years.

The relative humidity of the atmosphere was greater than for 1861, but less than the average for eleven years.

The amount of rain that fell was nearly an inch more than in 1861, 45.656 inches, but three-quarters of an inch less than the average for eleven years.

It rained or snowed 134 days during the year. The month of June furnished the greatest amount of rain, 6.592 inches, when it rained 15 days. August the least, 1.455 inches, and for only 7 days.

*General Abstract of Meteorological Observations, made at Philadelphia, Pa., during the year* 1862.
By JAMES A. KIRKPATRICK, A. M., Prof. of Civil Engineering in the Central High School of Philadelphia.
(Barometer sixty feet above mean tide in the Delaware River.)

| 1862. | THERMOMETER. | | | | | | | | | BAROMETER REDUCED TO 32° F. But not corrected for altitude. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | RANGE. | | | MEANS. | | | | | | RANGE. | | MEANS. | | | |
| MONTHS. | Max. | Min. | Monthly. | Mean daily. | Mean of daily oscillations. | 7 A. M. | 2 P. M. | 9 P. M. | Average. | Max. | Min. | Monthly. | Mean daily. | 7 A. M. | 2 P. M. | 9 P. M. | Average. |
| | ° | ° | ° | ° | ° | ° | ° | ° | ° | inches. | inches. | inches. | inches. | inches. | inches. | inches. | inches. |
| January | 54 | 10 | 44 | 5.04 | 10.21 | 29.36 | 34.47 | 31.97 | 31.93 | 30.408 | 29.325 | 1.083 | .261 | 29.942 | 29.894 | 29.931 | 29.922 |
| February | 52 | 16 | 36 | 5.55 | 10.89 | 28.36 | 36.00 | 31.64 | 32.00 | 30.322 | 29.216 | 1.106 | .225 | 29.939 | 29.891 | 29.922 | 29.917 |
| March | 56 | 22 | 34 | 3.95 | 14.44 | 34.24 | 44.21 | 39.18 | 39.21 | 30.173 | 29.276 | .897 | .173 | 29.804 | 29.747 | 29.795 | 29.782 |
| April | 82 | 28 | 54 | 5.89 | 17.87 | 44.57 | 55.23 | 48.28 | 49.36 | 30.321 | 29.422 | .899 | .146 | 30.025 | 29.979 | 29.994 | 29.999 |
| May | 85 | 40 | 45 | 5.77 | 19.81 | 57.85 | 70.08 | 61.32 | 63.08 | 30.058 | 29.518 | .540 | .124 | 29.785 | 29.740 | 29.760 | 29.762 |
| June | 89 | 47 | 42 | 5.34 | 17.60 | 64.57 | 74.72 | 66.75 | 68.68 | 30.146 | 29.375 | .771 | .123 | 29.738 | 29.706 | 29.728 | 29.724 |
| July | 95½ | 53 | 42½ | 4.23 | 17.50 | 71.13 | 82.06 | 73.60 | 75.60 | 30.156 | 29.487 | .669 | .107 | 29.743 | 29.724 | 29.731 | 29.733 |
| August | 95 | 54 | 41 | 3.89 | 16.56 | 71.47 | 82.93 | 75.13 | 76.51 | 30.099 | 29.557 | .542 | .122 | 29.829 | 29.796 | 29.818 | 29.814 |
| September | 87 | 48 | 39 | 4.30 | 16.22 | 63.53 | 76.03 | 67.55 | 69.04 | 30.086 | 29.398 | .688 | .128 | 29.881 | 29.845 | 29.876 | 29.867 |
| October | 86 | 35 | 51 | 5.48 | 15.31 | 52.70 | 64 29 | 56.98 | 57.99 | 30.201 | 29.307 | .894 | .151 | 29.865 | 29.825 | 29.859 | 29.850 |
| November | 71 | 27 | 44 | 5.94 | 13.40 | 40.67 | 48.18 | 43.25 | 44.03 | 30.555 | 29.380 | 1.175 | .159 | 29.877 | 29.823 | 29.870 | 29.857 |
| December | 64 | 8 | 56 | 6.46 | 12.74 | 32.24 | 39.76 | 34.71 | 35.57 | 30.495 | 29.319 | 1.176 | .197 | 29.932 | 29.895 | 29.936 | 29.921 |
| Annual means | 95½ | 8 | 87½ | 5.15 | 15.21 | 49.22 | 59.00 | 52.53 | 53.58 | 30.555 | 29.216 | 1.339 | .160 | 29.863 | 29.822 | 29.852 | 29.846 |
| Winter | 64 | 10 | 54 | 5.42 | 11.89 | 30.08 | 37.58 | 33.16 | 33.60 | 30.462 | 29.216 | 1.246 | .215 | 29.973 | 29.926 | 29.955 | 29.951 |
| Spring | 85 | 22 | 63 | 5.20 | 17.37 | 45.55 | 56.51 | 49.59 | 50 55 | 30.321 | 29.276 | 1.045 | .148 | 29.871 | 29.822 | 29.850 | 29.818 |
| Summer | 95½ | 47 | 48½ | 4.49 | 17.22 | 69.06 | 79.90 | 71.83 | 73.60 | 30.156 | 29.375 | .781 | .117 | 29.770 | 29.742 | 29.759 | 29.757 |
| Autumn | 87 | 27 | 60 | 5.24 | 14.98 | 52.30 | 62.83 | 55.93 | 57.02 | 30.555 | 29.307 | 1.248 | .146 | 29.874 | 29.831 | 29.868 | 29.858 |
| For eleven years | 100½ | —5½ | 106 | 5.57 | 15.19 | 49.69 | 59.96 | 53.14 | 54.26 | 30.704 | 28.884 | 1.820 | .156 | 29.890 | 29.850 | 29.874 | 29.871 |

*Meteorological Observations*—Continued.

| 1862. Months. | Relative Humidity. Max. | Min. | Means. 7 A. M. | 2 P. M. | 9 P. M. | Force of Vapour. Max. | Min. | Means. 7 A. M. | 2 P. M. | 9 P. M. | Average. | Rain and Melted Snow. Amount. | No. of days on which it fell. | Clouds. Percentage of sky covered. Means. 7 A. M. | 2 P. M. | 9 P. M. | Average. | Winds. Monthly resultant; No. of times in 1000. | Dew-point. Max. | Min. | Means. 7 A. M. | 2 P. M. | 9 P. M. | Average. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | p. c. | p. c. | p. c. | p. c. | p. c. | inch. | inch. | inch. | inch. | inch. | inch. | inch. | days. | p. c. | p. c. | p. c. | p. c. | Direction from. | ° | ° | ° | ° | ° | ° |
| January . . | 100 | 32 | 80.0 | 70.7 | 75.4 | .275 | .051 | .131 | .145 | .142 | .140 | 4.500 | 16 | 75 | 74 | 74 | 74 | N. 18° 26′ W., 335 | 42.7 | 3.4 | 23.81 | 25.23 | 24.49 | 24.51 |
| February . . | 100 | 44 | 80.4 | 66.6 | 77.9 | .267 | .060 | .130 | .143 | .142 | .138 | 4.277 | 15 | 76 | 73 | 61 | 70 | N. 45° 0′ W., 208 | 42.0 | 7.3 | 23.08 | 25.57 | 25.43 | 24.69 |
| March . . . | 95 | 25 | 74.4 | 56.2 | 70.5 | .389 | .081 | .149 | .159 | .171 | .159 | 3.509 | 11 | 62 | 66 | 66 | 65 | N. 43° 7′ W., 377 | 52.1 | 13.9 | 26.76 | 28.05 | 29.86 | 28.22 |
| April. . . . | 94 | 18 | 67.8 | 48.5 | 64.5 | .555 | .091 | .211 | .219 | .228 | .219 | 3.947 | 11 | 69 | 67 | 49 | 62 | N. 45° 0′ E., 47 | 61.9 | 16.2 | 34.15 | 34.34 | 35.95 | 34.81 |
| May . . . . | 93 | 18 | 64.2 | 44.9 | 60.3 | .594 | .105 | .320 | .324 | .335 | .326 | 2.083 | 9 | 60 | 60 | 41 | 54 | N. 53° 37′ W., 136 | 63.9 | 19.4 | 44.89 | 45.03 | 46.53 | 45.48 |
| June . . . . | 94 | 33 | 74.7 | 55.5 | 74.3 | .770 | .180 | .463 | .470 | .498 | .477 | 6.592 | 15 | 72 | 67 | 51 | 63 | S. 79° 23′ W., 97 | 71.4 | 31.8 | 55.94 | 56.43 | 57.91 | 56.76 |
| July . . . . | 97 | 36 | 72.7 | 49.7 | 71.0 | .813 | .311 | .561 | .544 | .594 | .566 | 2.841 | 10 | 64 | 63 | 50 | 59 | S. 58° 24′ W., 186 | 73.1 | 52.1 | 61.70 | 60.80 | 63.41 | 61.97 |
| August . . . | 87 | 30 | 70.5 | 45.6 | 65.4 | .939 | .290 | .562 | .524 | .586 | .557 | 1.455 | 7 | 47 | 59 | 38 | 48 | S. 90° 0′ W., 117 | 77.4 | 44.1 | 61.15 | 59.16 | 62.38 | 60.89 |
| September . . | 97 | 32 | 77.1 | 54.0 | 75.4 | .833 | .211 | .465 | .490 | .519 | .491 | 6.282 | 6 | 59 | 50 | 45 | 51 | N 4° 5′ E., 87 | 73.8 | 35.9 | 55.82 | 57.31 | 59.30 | 57.48 |
| October . . . | 97 | 33 | 79.5 | 59.7 | 73.5 | .695 | .133 | .340 | .378 | .365 | .361 | 4.160 | 11 | 54 | 52 | 49 | 52 | N. 73° 30′ W., 163 | 68.4 | 24.6 | 46.81 | 48.85 | 48.21 | 47.79 |
| November . . | 100 | 37 | 79.4 | 64.5 | 75.1 | .548 | .106 | .213 | .228 | .224 | .222 | 4.455 | 15 | 64 | 64 | 64 | 64 | N. 79° 0′ W., 237 | 61.6 | 19.6 | 34.64 | 35.95 | 35.70 | 35.43 |
| December . . | 92 | 31 | 78.5 | 61.5 | 74.8 | .377 | .040 | .154 | .163 | .162 | .160 | 1.555 | 8 | 53 | 59 | 43 | 51 | N. 84° 24′ W., 301 | 51.2 | —1.4 | 26.45 | 27.27 | 27.55 | 27.09 |
| Annual means | 100 | 18 | 74.9 | 56.4 | 71.5 | .939 | .040 | .308 | .316 | .330 | .318 | 45.656 | 134 | 63 | 63 | 52 | 59 | N. 58° 40′ W., 159 | 77.4 | —1.4 | 41.22 | 42.00 | 43.06 | 42.09 |
| Winter . . . | 100 | 23 | 80.0 | 66.4 | 77.3 | .390 | .051 | .140 | .154 | .152 | .149 | 10.793 | 35 | 70 | 67 | 56 | 65 | N. 47° 35′ W., 274 | 52.1 | 3.4 | 24.60 | 26.76 | 26.57 | 25.98 |
| Spring . . . | 95 | 18 | 68.8 | 49.9 | 65.1 | .594 | .081 | .227 | .234 | .245 | .235 | 9.539 | 31 | 64 | 65 | 52 | 60 | N. 48° 18′ W., 143 | 63.9 | 13.9 | 35.27 | 35.81 | 37.44 | 36.17 |
| Summer. . . | 97 | 30 | 72.6 | 50.3 | 70.2 | .939 | .180 | .529 | .513 | .559 | .533 | 10.888 | 32 | 61 | 63 | 46 | 57 | S. 72° 58′ W., 128 | 77.4 | 31.8 | 59.60 | 58.80 | 61.23 | 59.87 |
| Autumn . . | 100 | 32 | 78.7 | 59.4 | 74.7 | .833 | .106 | .339 | .365 | .369 | .358 | 14.897 | 32 | 59 | 55 | 53 | 56 | N. 64° 56′ W., 140 | 73.8 | 19.6 | 45.59 | 47.37 | 47.74 | 46.90 |
| For eleven yr's | 100 | 13 | 76.1 | 57.5 | 72.4 | 1.059 | .013 | .324 | .341 | .345 | .337 | 44.936 | 127 | 59 | 60 | 45 | 55 | N. 74° 29′ W., 227 | 79.7 | —16.5 | | 43.52 | | |

*A Comparison of some of the Meteorological Phenomena of the year* 1862 *with those of* 1861, *and of the last* ELEVEN *years, at Philadelphia, Pa.*

Lat. 39° 57½′ N. Long. 75° 10½′ W. from Greenwich. Height of barometer fount, sixty feet above mean tide in the Delaware River.

| | 1862. | 1861. | 11 YEARS. |
|---|---|---|---|
| THERMOMETER. | | | |
| Highest—Degrees . | 95½° July 7 | 95° July 8 | 100½° July 21, 1854 |
| Lowest " . | 8 Dec. 21 | —1 Feb. 8 | —5½ Jan. 23, 1857 |
| Mean of warmest day | 87.67 Aug. 9 | 87.80 July 8 | 91.30 July 21, 1854 |
| Coldest day—mean | 15.83 Dec. 20 | 7.80 Jan. 13 | —1.00 Jan. 9, 1856 |
| Mean daily oscillat'n | 15.21 | 16.85 | 15.19 |
| " range . | 5.15 | 5.57 | 5.57 |
| Means at 7 A. M. . | 49.22 | 50.15 | 49.69 |
| " 2 P. M. . | 59.00 | 60.74 | 59.96 |
| " 9 P. M. . | 52.53 | 53.24 | 53.14 |
| " for the year | 53.58 | 54.71 | 54.26 |
| BAROMETER. | | | |
| Highest—Inches | 30.555 in. Nov. 16 | 30.526 in. Jan. 23 | 30.704 in. Jan. 28, 1853 |
| Lowest " . | 29.216 Feb. 24 | 29.096 May 27 | 28.884 Apr. 21, 1852 |
| Great'st d'y pressure | 30.509 Nov. 16 | 30.483 Jan. 23 | 30.611 Dec. 18, 1856 |
| Least daily pressure | 29.390 Feb. 24 | 29.243 May 27 | 28.959 Apr. 21, 1852 |
| Mean daily range . | 0.160 | 0.167 | 0.156 |
| Means at 7 A. M. . | 29.863 | 29.890 | 29.890 |
| " 2 P. M. . | 29.822 | 29.845 | 29.850 |
| " 9 P. M. . | 29.852 | 29.870 | 29.874 |
| " for the year | 29.846 | 29.868 | 29.871 |
| FORCE OF VAPOUR. | | | |
| Greatest—Inches . | 0.939 in. Aug. 8 | 0.841 in. Aug. 5 | 1.059 in. June 30, 1855 |
| Least " . | 0.040 Dec. 20 | .023 Feb. 8 | .013 Feb. 6, 1855 |
| Means at 7 A. M. . | .308 | .319 | .324 |
| " 2 P. M. . | .316 | .332 | .341 |
| " 9 P. M. . | .330 | .343 | .345 |
| " for the year | .318 | .331 | .337 |
| RELATIVE HUMIDITY. | | | |
| Greatest per cent. . | 100 per ct., often | 100 per ct., often | 100 per ct., often |
| Least " . | 18. Apr. 27, May 8 | 18 " May 2 | 13 " Apr. 13, 1852 |
| Means at 7 A. M. . | 74.9 per ct. | 74.8 " | 76.1 " |
| " 2 P. M. . | 56.4 | 54.9 | 57.5 |
| " 9 P. M. . | 71.5 | 72.5 | 72.4 |
| " for the year | 67.6 | 67.4 | 68.7 |
| CLOUDS. | | | |
| No. of clear days . | 100 days | 109 days | 111.7 days |
| " cloudy days | 265 " | 256 " | 253.5 " |
| Means of sky covered at 7 A. M. . | 62.9 per ct. | 58.7 per ct. | 59.5 per ct. |
| " 2 P. M. . | 62.8 | 61.6 | 60.0 |
| " 9 P. M. | 52.5 | 46.2 | 44.8 |
| for the year . | 59.4 | 55.5 | 54.8 |
| Rain or melted snow, amount . | 45.656 in. | 46.414 in. | 44.936 in. |
| No. of days on which rain or snow fell | 134 days | 125 days | 127 days |
| Prevailing winds, from . . . . | N. 58° 40′ W. .159 | N. 81° 41′ W. .239 | N. 74° 29′ W. .227 |

Births, Marriages and Deaths.—It will be highly gratifying to the fellows of the College to learn, that the law for the registration of births, marriages, and deaths, in which they took an early and active part, has thus far been attended with very satisfactory results. Nor will it be considered a useless repetition to add, that it has already become a popular and permanent institution of our city. No expense has been spared by the Board of Health, to carry out efficiently the objects of this law. Nor is it any longer considered an unnecessary tax upon time, by those who are required to make their returns. For the most part the law is cheerfully and promptly complied with by all. The few exceptions to this are rapidly yielding their opposition, as the value of the law becomes more generally known and appreciated.

*Births.*—The births registered for the year 1862 (Table I.) have amounted to 14,741; of these, 7609 were males and 7132 were females. This shows an excess in favour of males equal to 7 per cent.

From investigations made by M. Villermé, of Paris, and confirmed by Dr. Emerson, in a paper on the Medical Statistics of Philadelphia, published in 1831,[1] in which he constructed a table of the births for each month, during a period of ten years, he showed that certain months of the year, independent of other causes, exerted an unfavourable influence on both conception and the increase of population by reproduction. "These causes seem to prevail during the extreme heat of summer and in the commencement of autumn, the months of August, July and September, standing lowest in the scale designating the months of conception."

By taking the number of births for each month during the two full years in which the registration law has been in operation, 1861 and 1862, and arranging them so as to place those highest in the scale of births in their numerical order, and opposite to these the corresponding months of conception, and similar results with those procured by Dr. Emerson, on a larger scale, will be observed, as in the following table:—

| Months. | Whole Number of Births. | Corresponding Months of Conception. |
|---|---|---|
| 1. January | 2898 | June |
| 2. March | 2893 | April |
| 3. December | 2706 | October |
| 4. February | 2702 | November |
| 5. August | 2695 | March |
| 6. October | 2684 | May |
| 7. November | 2684 | February |
| 8. July | 2676 | December |
| 9. September | 2667 | January |
| 10. June | 2497 | September |
| 11. May | 2459 | July |
| 12. April | 2451 | August |

Thus it will be seen, that the months furnishing the minimum of births and conceptions for the two years correspond with those given by Dr. Emerson for a period of ten years, viz: August, July and September, the months of conception, and April, May and June the months giving the lowest number of births.

[1] Am. Journal of the Medical Sciences, vol. ix. p. 21.

TABLE I.—*Table of Births under the Registration Law, for the year ending December 31, 1862, with the Wards, Sexes, and Colour designated, together with the Percentage and Ratio of Births to Population of each Ward.*

| Months | Total | Births M. | Births F. | Black M. | Black F. | Stillborn M. | Stillborn F. | Twins | Triplets | Ward 1 | Ward 2 | Ward 3 | Ward 4 | Ward 5 | Ward 6 | Ward 7 | Ward 8 | Ward 9 | Ward 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 1,396 | 751 | 645 | 14 | 14 | 46 | 30 | 12 | .. | 87 | 57 | 67 | 53 | 42 | 27 | 76 | 42 | 35 | 51 |
| February | 1,228 | 645 | 583 | 5 | 6 | 36 | 19 | 8 | .. | 79 | 54 | 31 | 71 | 21 | 41 | 71 | 23 | 39 | 41 |
| March | 1,325 | 645 | 680 | 8 | 9 | 38 | 22 | 16 | .. | 80 | 60 | 45 | 70 | 30 | 36 | 61 | 27 | 28 | 41 |
| April | 1,128 | 572 | 556 | 11 | 13 | 27 | 25 | 8 | .. | 78 | 51 | 47 | 53 | 32 | 29 | 58 | 28 | 29 | 42 |
| May | 1,173 | 615 | 558 | 13 | 10 | 33 | 33 | 17 | .. | 77 | 62 | 44 | 58 | 27 | 25 | 50 | 35 | 24 | 51 |
| June | 1,152 | 584 | 568 | 8 | 12 | 24 | 29 | 19 | .. | 76 | 63 | 47 | 63 | 22 | 33 | 70 | 37 | 29 | 29 |
| July | 1,181 | 610 | 571 | 7 | 11 | 33 | 25 | 11 | .. | 83 | 68 | 32 | 53 | 41 | 30 | 54 | 29 | 27 | 34 |
| August | 1,206 | 627 | 579 | 21 | 14 | 35 | 26 | 11 | .. | 81 | 57 | 47 | 61 | 37 | 30 | 67 | 33 | 28 | 40 |
| September | 1,227 | 622 | 605 | 7 | 9 | 31 | 18 | 8 | .. | 108 | 64 | 45 | 56 | 34 | 25 | 54 | 33 | 32 | 50 |
| October | 1,266 | 683 | 583 | 2 | 17 | 48 | 23 | 17 | .. | 90 | 73 | 36 | 58 | 38 | 25 | 66 | 28 | 31 | 41 |
| November | 1,231 | 650 | 581 | 15 | 5 | 37 | 23 | 8 | .. | 86 | 63 | 48 | 60 | 23 | 25 | 53 | 32 | 32 | 47 |
| December | 1,228 | 605 | 623 | 6 | 11 | 27 | 24 | 16 | 1 | 91 | 71 | 33 | 47 | 32 | 35 | 50 | 25 | 33 | 31 |
| Total | 14,741 | 7609 | 7132 | 117 | 134 | 444 | 297 | 154 | 1 | 1016 | 719 | 515 | 693 | 383 | 361 | 720 | 372 | 352 | 490 |
| Population of each ward | | | | | | | | | | 30,886 | 20,123 | 19,929 | 23,461 | 21,792 | 11,882 | 31,267 | 27,770 | 17,198 | 21,849 |
| Percentage of births to population | | | | | | | | | | 3.28 | 2.57 | 2.58 | 2.95 | 1.55 | 2.42 | 2.30 | 1.34 | 2.04 | 2.21 |
| Ratio of births to population | | | | | | | | | | 30.39 | 38.88 | 38.69 | 33.85 | 64.72 | 41.22 | 43.42 | 74.65 | 48.85 | 44.58 |

| Months | Ward 11 | Ward 12 | Ward 13 | Ward 14 | Ward 15 | Ward 16 | Ward 17 | Ward 18 | Ward 19 | Ward 20 | Ward 21 | Ward 22 | Ward 23 | Ward 24 | Ward 25 | Wards not given |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 54 | 40 | 55 | 47 | 107 | 43 | 81 | 43 | 100 | 84 | 49 | 45 | 30 | 63 | 20 | 8 |
| February | 39 | 49 | 37 | 38 | 82 | 49 | 61 | 31 | 92 | 71 | 40 | 37 | 47 | 64 | 6 | 2 |
| March | 34 | 48 | 40 | 49 | 95 | 61 | 72 | 48 | 100 | 74 | 43 | 37 | 47 | 76 | 18 | 8 |
| April | 33 | 44 | 31 | 38 | 63 | 56 | 53 | 40 | 79 | 61 | 42 | 32 | 41 | 54 | 17 | 3 |
| May | 33 | 28 | 30 | 47 | 86 | 44 | 61 | 40 | 79 | 80 | 34 | 41 | 38 | 61 | 13 | 5 |
| June | 32 | 28 | 46 | 52 | 72 | 46 | 64 | 41 | 55 | 71 | 31 | 44 | 31 | 69 | 17 | 3 |
| July | 32 | 36 | 31 | 46 | 80 | 39 | 86 | 42 | 69 | 85 | 37 | 44 | 33 | 66 | 13 | 8 |
| August | 31 | 28 | 24 | 46 | 81 | 49 | 64 | 46 | 74 | 80 | 42 | 32 | 40 | 64 | 16 | 3 |
| September | 43 | 43 | 39 | 52 | 97 | 57 | 61 | 33 | 73 | 69 | 38 | 34 | 44 | 52 | 12 | 1 |
| October | 49 | 39 | 48 | 65 | 78 | 52 | 55 | 43 | 67 | 80 | 43 | 35 | 36 | 58 | 24 | 4 |
| November | 47 | 32 | 37 | 40 | 88 | 47 | 65 | 37 | 100 | 77 | 31 | 35 | 33 | 67 | 22 | 4 |
| December | 40 | 50 | 45 | 52 | 80 | 62 | 67 | 33 | 69 | 62 | 29 | 47 | 43 | 49 | 16 | 13 |
| Total | 464 | 465 | 463 | 572 | 1009 | 605 | 770 | 480 | 957 | 923 | 457 | 463 | 463 | 743 | 194 | 62 |
| Population of each ward | 16,681 | 16,681 | 20,045 | 24,258 | 32,091 | 20,067 | 23,284 | 20,441 | 38,828 | 29,963 | 17,159 | 17,173 | 24,085 | 23,738 | | |
| Percentage of births to population | 2.78 | 2.78 | 2.31 | 2.35 | 3.14 | 3.01 | 3.30 | 2.34 | 2.46 | 3.08 | 2.66 | 2.69 | 1.93 | 3.13 | | |
| Ratio of births to population | 35.95 | 35.87 | 43.29 | 42.40 | 31.80 | 33.16 | 30.21 | 42.58 | 40.57 | 32.46 | 37.54 | 37.09 | 51.80 | 31.94 | | |

The explanation proposed by M. Villermé to account for the variation found at different seasons in the births and conceptions, was "the direct or indirect influence of the annual revolution of the earth around the sun, or in other words, to the order of the seasons." Dr. Emerson falls in with the views of the French *savan*, that fecundity in this region at least, is materially affected by high temperature, but considers that an epidemic influence, during the period embraced in his calculations, acted as a retarding force to conception.

I am therefore disposed to attribute the diminished number of births in the months of April, May and June, for the two years past, to the extreme heat in the corresponding months of conception, viz: August, July and September, in connection with the insalubrity of the season, as it is well understood that the prevalence of endemics, during these months, increases materially our bills of mortality.

The first ward, with a population of 30,886, contributed 1006, equal to an increase of 3.28 per cent. of its population. The fifteenth, containing 32,091 souls, gave 1009, or an increase of 3.14 per cent. The nineteenth ward, with its teeming population of 38,828 does not appear to be as productive as the two former wards, as it added only 957 births, an increase of 2.46 per cent. This number of recorded births is less by 2530, or 2.72 per cent., than that of 1861.

This falling off cannot be attributed to a defective record, caused by a delinquency on the part of those appointed to collect the births, or of those required to make returns. The greatest watchfulness has been observed by the health officer and his clerks, to secure the monthly returns, and I have the assurance that the number of physicians and midwives making returns, has been greater than those for 1861.

I can only attribute this decrease in the number of births, to the disturbing events connected with the rebellion.

It will be borne in mind that not only epidemics, but other agencies of a moral, social and national character, operating on a community to the depression of their mental and physical energies, will, by reducing the forces of organic life, unfavourably affect the increase of the population by reproduction.

I therefore believe that to the discouraging influences of the present war, and the agitated and unsettled state of the country, may be justly ascribed, in a great measure, the falling off of the totals of births for the year.

The daily average of births has been $40\frac{1}{3}$.

The first three months of the year furnished the largest number of births, April, May and June the lowest. January gave the highest, 1396, and April the lowest, 1128.

The most prolific ward appears to have been the seventeenth which yielded 770 births, or 3.30 per cent. in a population of 23,264.

The ward yielding the fewest births according to its population was the eighth. With a population of 27,770 it gave only 372 births, or 1.34 per cent., which is only one in 74.65 hundredths of its inhabitants.

In fifteen out of the twenty-five wards, the births exceeded the deaths. The fifteenth, twentieth, twenty-first, and twenty-second wards, presented the greatest contrast between the births and deaths. In the former, they exceeded the deaths by 190. In the three latter, they averaged an excess of 174.

In the remaining ten wards, the deaths exceeded the births, and the inference is a want of material prosperity in the community, or a defect in their natural numerical growth.

The preceding year (1861) yielded an increase of population by births over the deaths of 19 per cent. The year under consideration (1862), shows a decrease in population, by the deaths exceeding the births, equal to 2.38 per cent. This calculation is based upon the aggregate of deaths recorded for the year, but if the deaths of soldiers are deducted, the births will furnish an increase in the population of 6 per cent. over the waste by death.

The number of births on record from our coloured population amounted to 251. The deaths in the population reached 721. This record gives an excess of deaths among blacks of 65 per cent. over the births, and if the hypothesis be true, that a preponderance of births over deaths in a community is an index of prosperity in numerical growth, the inference is that our black population is diminishing.

Twin births to the number of 154 have been recorded. One triplet birth was returned for the year, in the month of December.

The stillbirths amounted to 711. Of this number 414 were males and 297 were females; an excess of male stillborn children equal to 39 per cent.

*Marriages.*—The total of marriages recorded for the year (Table II.) have been 4662, an increase of 245 over those for 1861.

TABLE II.—*Ages of Persons Married and recorded under the Registration Law for the year ending December* 31, 1862.

| AGES OF THE MEN. | AGES OF THE WOMEN. | | | | | | | | | TOTAL OF THE MEN. |
|---|---|---|---|---|---|---|---|---|---|---|
| | Under 20 | 20 to 25 | 25 to 30 | 30 to 40 | 40 to 50 | 50 to 60 | 60 to 70 | 70 to 80 | Age not given. | |
| Under 20 | 15 | 4 | | | | | | | | 19 |
| 20 to 25 | 565 | 798 | 92 | 13 | 3 | | | | 12 | 1483 |
| 25 to 30 | 166 | 760 | 328 | 64 | 4 | | | | 17 | 1339 |
| 30 to 40 | 62 | 326 | 276 | 198 | 20 | 1 | | | 6 | 889 |
| 40 to 50 | 2 | 38 | 58 | 124 | 42 | 1 | | | 6 | 271 |
| 50 to 60 | | 4 | 6 | 35 | 24 | 16 | 1 | | 1 | 87 |
| 60 to 70 | | 1 | 1 | 3 | 10 | 10 | 1 | | 1 | 27 |
| 70 to 80 | | | | 1 | 3 | 3 | 2 | | | 9 |
| Age not given. | 6 | 8 | 7 | 2 | | | | | 515 | 538 |
| TOTAL OF THE WOMEN. | 816 | 1939 | 768 | 440 | 106 | 31 | 4 | | 558 | 4662 |

This department of the office does not afford the same amount of satisfaction that is given in the other branches. The defect is due alone to the indifference on the part of clergymen in making their returns in accordance with the law.

The table referred to gives the ages of the parties married as far as they were returned. It will be seen, however, that in 1096, or about 12 per cent. of the names returned, the ages were not given.

Of the parties married, 816, or 17.50 per cent. of the brides, were under twenty years of age, whereas only 19 of the grooms, or 00.47 per cent. were in their minority.

The most popular age for marriage appears to be between twenty and twenty-five. During this quinquennial period there were 1939 brides, equal to 41.59 per cent. of the total of marriages, and 1483 grooms, equal to 31.81 per cent.

Previous to this period, or twenty-five years of age, the brides, in point of numbers, are in the ascendant, but beyond it they rapidly decline, while the grooms increase.

Between twenty-five and thirty, there were only 768 brides or 16½ per cent., and 1339 or 28.72 per cent. of grooms.

There are nine marriages registered of men between seventy and eighty, and four women between the ages of sixty and seventy.

Table III. furnishes a record of the nativity of the brides and grooms.

TABLE III.—*Number of Marriages registered under the Registration Law for the year ending December* 31, 1862, *with the Nativity of the Brides and Grooms.*

| *NATIVITIES.* | | BIRTHPLACE OF BRIDES. | | | TOTAL OF GROOMS. |
|---|---|---|---|---|---|
| | | United States. | Foreign. | Not given. | |
| BIRTHPLACE OF GROOMS. | United States . . . | 2234 | 239 | 26 | 2499 |
| | Foreign . . . . . | 425 | 1535 | 4 | 1964 |
| | Not given . . . . | 27 | 14 | 158 | 199 |
| TOTAL OF BRIDES . . . . | | 2686 | 1788 | 188 | 4662 |

Of the whole number of persons married, 5185, equal to 55 per cent., were American born, and 3752, or 40 per cent., were of foreign birth.

387 or 4 per cent. of the parties married, were returned without their place of birth being named.

2686, or 57.61 per cent., of the brides were American born; of these, 425, or 16 per cent., married foreigners, while only 9 per cent. of the grooms born in the United States married foreign women.

*Deaths.*—The following table furnishes a general summary of the deaths for the year 1862:—

| | | | |
|---|---|---|---|
| White | | 14,376 | |
| Coloured | | 721 | |
| Total | | | 15,097 |
| Males | | 8,315 | |
| Females | | 6,782 | |
| Total | | | 15,097 |
| Male minors or children | 4,266 | | |
| Female " " | 3,772 | | |
| Total minors | | 8,038 | |
| Male adults | 4,049 | | |
| Female adults | 3,010 | | |
| Total adults | | 7,059 | |
| Total | | | 15,097 |
| Deaths from registered diseases | | 13,232 | |
| Deaths from stillborn | | 711 | |
| Deaths from old age | | 219 | |
| Deaths from unknown causes | | 97 | |
| Deaths from external and accidental causes | | 838 | |
| Total from all causes | | | 15,097 |

A comparison of this total of 15,097 with the total returns of the previous year, 1861, will show an increase of deaths recorded for 1862, amounting to 629, equivalent to an increase of 4 per cent., and is the highest aggregate on record of any former year.

The announcement of this fact is at variance with my congratulatory introduction, and requires an explanation.

It would be doing great injustice to the sanitary and mortuary interests of our city if the conclusion should be entertained that the augmentation of deaths for the year 1862, as found upon the record, has been the result of a high rate of city mortality growing out of, and influenced by the invasion and progress of epidemic diseases. Fortunately, there is ample and incontestable evidence to prove the contrary.

A single glance at the death-table from zymotics—an index of public health—a class of diseases by which may be distinguished the salubrity or unhealthiness of the year, furnishes the proof that they have fallen off in the aggregate to the extent of 558, equal to 16 per cent. when compared with those of the previous year, 1861.

One remarkable sign of the improved condition of the health of our city is the fact that those destructive epidemic diseases, scarlet fever, smallpox, and diphtheria, which prevailed in 1861 to a fearful degree, carrying to the grave 2450 of our population, have this year carried off only 1397 or 57 per cent. less than in 1861, and ere the year 1862 had closed, their epidemic influence was so far diminished as scarcely to have been recognized in the community.

There is, however, an agency foreign to the ordinary operating causes for the increase of our city mortality that has contributed in a large degree to swell the number of the annual death-roll. It is the war in which the country is at present involved. From this cause alone it can be shown that 1202 of the deaths registered are of the number who had fallen on the

battle-field, or had died from disease contracted in the camp, or on the march, many of whom have expired in the government hospitals throughout our city, and many who had returned home only to die among their friends.

None of these deaths properly belong to the annual mortality of the city, and in order to form a correct estimate, every one of them should be deducted. By this method the mortality will be reduced to 13,895, or about 4 per cent. less than that of 1861.

It may therefore with safety be announced that, notwithstanding the successful operation of the registration law, to which I so fully referred in my last report, and which enables us to secure a nearer approximation to the true number of deaths than ever before, the deaths of 1862 fall below those for 1861. This result furnishes the evidence that the city has been comparatively healthy during the year.

Nor is this good share of health to be ascribed in any measure to extensive sanitary improvements through the agency of our municipal authorities. As in former years, so with the past, very little interest has been taken towards the improvement of the hygiene of our city on the part of our councils.

The river docks continue to be receptacles for every description of filth, sending forth their fetid and deleterious miasma into the atmosphere; the city sewerage, with all the attention recently bestowed upon the traps at the inlets to the culverts, still afford imperfect drainage. Under existing arrangements, which allow the indiscriminate use of the culverts for conveying away the deposits of privies and water-closets, as well as the solid refuse from houses, yards, gutters, and streets, they may eventually entail upon the community a far greater sanitary evil than they are designed to remove.

The system of street-cleaning is still defective in many essentials. At best, it is very imperfectly executed. Many districts of the city, where the greatest need exists for sanitary conservation, receive but little if any attention.

Intra-mural interments, as applicable to those graveyards located in densely-populated neighbourhoods and in grounds already crowded to saturation with the decomposing remains of the dead, continue to be a nuisance, dangerous to public health, demanding legislative enactment as the only certain remedy for their entire abatement.

The proper disposal of street dirt and kitchen garbage, with their disgusting and unhealthy emanations, especially during the warm months—underground and cellar tenements, and other domiciliary arrangements, where defective light and ventilation with an overcrowded population and a want of the common conveniences of life prevail—slaughter-houses, hogs and pens, cow stables, filthy yards and alleys, together with a host of offensive manufacturing establishments, and a great diversity of minor nuisances, continue to be sanitary evils, crying aloud for redress.

These and similar causes may be regarded as among the prominent baneful influences contributing to depress the vital energies of our population, and engendering diseases of zymotic origin—diseases that are preventable, and which, with a more general knowledge of the laws of hygiene and a wisely directed practice, would in a great measure be obviated.

In addition to these prevalent and established causes for atmospheric contamination during the year, our once quiet and peaceful city was selected by the government as a location admirably adapted for hospital accommodations for the sick and wounded of the army. During the year

just closed there have been as many as twenty-two (22) military hospitals opened and occupied in various sections of the city.

Great anxiety at one time was felt for the health of the city when these hospitals were about to be opened. It was hardly to be expected that the introduction of several thousand cases of wounded and sick soldiers, under the most unfavourable circumstances for hygienic purposes, could take place—in addition to our ordinary amount of disease—without their exerting a contaminating atmospheric influence upon the sick as well as upon the healthy of the community. Nor was the fact that camp and typhoid fevers and dysenteries, and suppurating wounds of every description, would make up a large majority of the cases, and that the remainder would comprise the broken-down and feeble of the army, whose depraved systems were already thoroughly prepared for infection, calculated to lessen the excitement in the public mind.

It is highly gratifying, however, to be able to report that these fears and apprehensions have proved groundless. The admirably selected locations of these hospitals, with but few exceptions; the excellent management and unremitted attention of the surgeons in charge; the skill displayed by the attending surgeons and physicians; the valuable hygienic arrangements instituted, and, in short, the entire medical police established throughout, have proved of inestimable value in preventing the introduction and spread of epidemic and infectious diseases.

It would seem to be almost out of place, in this report, to allude in any manner to the extraordinary and praiseworthy services bestowed upon the sick and wounded soldiers, who have been the recipients, from time to time, of these hospitals, by all classes of our citizens. I cannot refrain from noticing more especially the commendable and the disinterested devotion of the ladies, who have contributed so largely to the alleviation of the sufferings of these noble men, by their personal attendance, and have distributed with a liberal hand supplies and delicacies of every description, with a kindness and earnestness which belong alone to woman.

Through the politeness of the surgeons in charge of the government hospitals located in our city, I have been able to furnish the number of cases under treatment, as well as the number of deaths during the year—or, from the date of their opening up to the 31st of December, 1862, as follows:—

| Opened in 1862. | Location. | Surgeons. | Cases. | Deaths. | Per ct. | Deaths to cases. |
|---|---|---|---|---|---|---|
| Jan. 1st | Broad Street[1] | Dr. John Neal | 3,206 | 89 | 2.50 | 1 in 36 |
| June 1st | W. Philadelphia | " Hayes | 5,156 | 164 | 3 | 1 in 31½ |
| March 9th | South Street[2] | " Hart | 1,163 | 47 | 4 | 1 in 25 |
| " | 5th & Buttonwood | " Bournonville | 1,665 | 78 | 4.75 | 1 in 21 |
| March 5th | Wood Street | " Horner | 1,021 | 22 | 2 | 1 in 46 |
| Aug. 19th | Filbert Street | " Breed | 967 | 16 | 2 | 1 in 60 |
| Jan 1st | Christian Street | " Reese | 964 | 40 | 4 | 1 in 24 |
| June 18th | Master Street | " Goddard | 953 | 43 | 4.50 | 1 in 22 |
| Sept. 3d | Race Street | " Burpee | 828 | 9 | 1 | 1 in 92 |
| March | St. Joseph's | " Moon | 713 | 29 | 4 | 1 in 24 |
| July 5th | Germantown | " Darrach | 651 | 4 | .50 | 1 in 257 |
| July 30th | Episcopal | " Thomas | 531 | 33[3] | 7 | 1 in 16 |
| " | 4th & George | " Harlow | 527 | 46 | 9 | 1 in 11½ |
| Aug. 18th | Hestonville | " Agnew | 301 | 4 | 1 | 1 in 75 |
| " | 12th & Buttonwood | " Morton | 257 | 1 | 0.39 | 1 in 163 |
| Nov. 2d | Haddington | " Levis | 191 | | | |
| " | Turner's Lane | " E. S. Dunster | 606 | 17 | 2.75 | |
| March 1st | Summit House | " Sergeant | 773 | 32 | 4 | 1 in 24 |
| July 11th | Catharine Street | " Picot | 199 | 8 | 4 | 1 in 25 |
| " | Broad & Prime | " Kenderdine | 270 | 35[3] | 13 | 1 in 7 |
| " | Islington Lane | " J.V. Patterson | 17 | 1 | | 1 in 17 |
| " | Camac's Woods | " W. M. Camac | 14 | | | |
| | | | 20,973 | 718 | 3.39 | 1 in 44 |
| | Cooper Shop | " Nebinger | | 8 | | |
| | Union Hospital | " Ward | | 14 | | |

From this record it will be seen that 20,973 medical and surgical cases have been treated in these hospitals, with a loss by death of only 718, or 3 per cent., and as one death in every 44 of the cases.

When all the unfavourable circumstances surrounding these sick and wounded soldiers from the date of their injuries on the battle field, or their sickness in camp, their exposure and sufferings, from the want of timely surgical and medical attention, the distance they were conveyed by land and water carriage, and the unpromising condition in which many of them were found upon their arrival at the hospital to which they were conveyed, some of whom were moribund, and quite a number dying on that or the following day—the wonder is, that the percentage of mortality among them was not far higher. No stronger evidence could be produced of the skilful manner in which the medical and surgical treatment in the government hospitals of our city has been conducted, than this limited percentage of deaths.

Estimating the population of the city at 600,000, and the aggregate deaths on record 15,097, as represented in Table No. 4, which includes 711 stillborn children, and 1202 deaths of soldiers, which do not properly belong to our city mortality, and it gives us one death in every 40, or twenty-five deaths in every 1000 of the population.

By deducting the stillborn and the deaths of soldiers which I have designated as of foreign origin, and the result presents a more favourable estimate; one death in every 45 of the population, and twenty-two in every 1000.

[1] The regular treatment did not commence until June 1. [2] Opened in 1861.
[3] Many of these were moribund when brought from the cars.

Of the sexes the rate of mortality has been 8315 males, and 6782 females. This is an unusual excess of male deaths, equal to 1523 or 23 per cent., amounting to more than double the ordinary excess of deaths among males, and may be properly attributed to the large number of the remains of soldiers brought here for burial, and of those who expired in the U. S. hospitals in our city.

The adult deaths were 7059; the minors or children 8038. This excess of deaths in minors, or those under twenty years of age, has been unusually small, not over 14 per cent. Last year it reached 64 per cent. The highest number of deaths in any one period of life, was among infants under one year. They amounted to 3661 (including the stillborn) equal to 23 per cent. of all the deaths. Those under five years numbered 6626, equal to 44 per cent.

By reference it will be found that these figures fall considerably below those of the previous year. This difference is owing mainly to the decline of deaths from smallpox, scarlet fever and diphtheria.

The number of adult deaths compared with those of minors is a very prominent feature in this report. Those between 20 and 40 years amounted to 3336, or 48.50 per cent. above those in the same period for 1861. Those between 40 and 70 were 2666, or 18.69 per cent. more than those in 1861.

From seventy upwards to extreme old age, the deaths were 1057, or 18.69 per cent. over those in 1861; the variation, though not very great, is sufficient to prove that some extraordinary influence was at work to effect the change.

The same outside cause, to which I have already adverted—the mortality in the army of the United States, will in a great degree account for these results.

MONTHLY MORTALITY.—The deaths for several months throughout the year are given in the accompanying table.

*Return of Deaths in each Month, showing the number of Deceased Males and Females, Adults and Children, for the year* 1862.

| 1862. Months. | Males. | Females. | Adults. | Children. | Total. |
|---|---|---|---|---|---|
| January | 664 | 650 | 557 | 757 | 1,314 |
| February | 576 | 504 | 460 | 620 | 1,080 |
| March | 601 | 603 | 531 | 673 | 1,204 |
| April | 660 | 553 | 586 | 627 | 1,213 |
| May | 685 | 660 | 653 | 692 | 1,345 |
| June | 551 | 451 | 480 | 522 | 1,002 |
| July | 966 | 801 | 649 | 1,118 | 1,767 |
| August | 1,061 | 594 | 803 | 952 | 1,755 |
| September | 573 | 464 | 490 | 547 | 1,037 |
| October | 754 | 481 | 676 | 559 | 1,235 |
| November | 570 | 451 | 549 | 472 | 1,021 |
| December | 654 | 470 | 625 | 499 | 1,124 |
| | 8,315 | 6,782 | 7,059 | 8,038 | 15,097 |
| | $\underbrace{\qquad\qquad}_{15,097}$ | | $\underbrace{\qquad\qquad}_{15,097}$ | | |

The greatest number of deaths in any one month was in July, which furnished 1767, while August contributed 1755. June gave the lowest, 1002, and November the next, 1021.

The deaths in every month exceeded 1000, and have been more equally distributed than usual.

The month of May, generally a healthy period of the year, gave 1345 deaths—the third in numerical order of mortality.

The months of October, November and December, furnished a heavier mortality among adults than in children, equal to 20 per cent. This is an uncommon occurrence, and can only be accounted for by the deaths among soldiers.

Mortality in Wards.—The following table presents the deaths in each of the twenty-four wards, with the population of each ward according to the last census. The ratio of deaths to population calculated in this table, will differ from that elsewhere given, as it is based on the census of 1860, instead of reckoning the natural increase of the population.

Table IV.—*Mortality in each Ward, with the Population (according to the late Census), the ratio of Deaths to Population, the Percentage of Deaths in each Ward to the Total Mortality, and Deaths in each thousand of the Population. Also the Deaths from unknown Wards, from the Almshouse and from the Country.*

| Wards. | Population last census. | Deaths. | Deaths to population. | Per cent. of deaths to total mortality. | Deaths in each thousand of population. |
|---|---|---|---|---|---|
| First | 30,886 | 1,037 | 1 in 30 | 6.86 | 33.48 |
| Second | 29,123 | 827 | 1 " 36 | 5.47 | 28.51 |
| Third | 19,929 | 491 | 1 " 41 | 3.25 | 24.55 |
| Fourth | 23,461 | 711 | 1 " 33 | 4.70 | 30.87 |
| Fifth | 24,792 | 520 | 1 " 48 | 3.44 | 20.80 |
| Sixth | 14,882 | 350 | 1 " 43 | 2.31 | 23.33 |
| Seventh | 31,267 | 829 | 1 " 38 | 5.49 | 26.74 |
| Eighth | 27,770 | 465 | 1 " 60 | 3.08 | 16.60 |
| Ninth | 17,196 | 338 | 1 " 51 | 2.23 | 19.88 |
| Tenth | 21,849 | 599 | 1 " 37 | 3.96 | 27.27 |
| Eleventh | 16,681 | 384 | 1 " 44 | 2.54 | 22.58 |
| Twelfth | 16,681 | 429 | 1 " 39 | 2.84 | 25.23 |
| Thirteenth | 20,045 | 380 | 1 " 53 | 2.51 | 19.00 |
| Fourteenth | 24,258 | 493 | 1 " 50 | 3.26 | 20.54 |
| Fifteenth | 32,091 | 819 | 1 " 40 | 5.42 | 25.59 |
| Sixteenth | 20,067 | 520 | 1 " 39 | 3.44 | 26.00 |
| Seventeenth | 23,264 | 677 | 1 " 35 | 4.48 | 29.43 |
| Eighteenth | 20,441 | 596 | 1 " 35 | 3.94 | 29.80 |
| Nineteenth | 38,828 | 1,042 | 1 " 38 | 6.90 | 26.71 |
| Twentieth | 29,963 | 736 | 1 " 41 | 4.87 | 24.53 |
| Twenty-first | 17,159 | 284 | 1 " 61 | 1.88 | 16.70 |
| Twenty-second | 17,173 | 286 | 1 " 61 | 1.89 | 16.82 |
| Twenty-third | 23,985 | 329 | 1 " 73 | 2.17 | 13.70 |
| Twenty-fourth | 23,738 | 660 | 1 " 36 | 4.37 | 27.50 |
| Twenty-fifth | ...... | 130 | ...... | 0.86 | ...... |
| Unknown | ...... | 135 | ...... | 0.89 | ...... |
| Almshouse | ...... | 508 | ...... | 3.36 | ...... |
| From the country | ...... | 522 | ...... | 3.59 | ...... |
| Total for 12 mos. | ...... | 15,097 | | 100.00 | |
| Total population | 565,529 | | | | |
| Ratio of deaths to population | | ...... | 1 in 38 | | |

The first ward, this year, furnishes the highest number of deaths according to its population, 1037, and the twenty-third the lowest, 329. The former giving 33 and the latter 13 in every thousand of their population.

The first ward therefore appears to have been the most unhealthy, and the twenty-third the healthiest.

The deaths in the nineteenth ward are reduced a fraction less than in 1861, and although charged with 1042 deaths, it rates the eighth in the line of descent from the first ward, the most unhealthy, the deaths being 26.71 in every thousand of its population.

The seventeenth ward last year gave 36 deaths to every thousand of its population, and was rated the most unhealthy. This year it contributes only 29.80 to each thousand, and stands the fourth in numerical order from the first, the most unhealthy.

The five most unhealthy wards, all of them crowded and defective in sanitary improvement, have been the first, fourth, eighteenth, seventeenth and second, in the order named. They have furnished 32 per cent. of all the deaths for the year.

These are the same found grouped together in last year's report as the most unhealthy—substituting, however, the second for the nineteenth, and taking its place as the fifth in the line of descent from the most unhealthy.

There has been an increase in the number of deaths recorded, over those of the former year 1861—in fifteen of the wards, while in the ninth, eleventh, thirteenth, sixteenth, seventeenth, nineteenth, twentieth, twenty-first and twenty-third, they have fallen off.

The eighth ward, with its 27,770 inhabitants, continues to present a very favourable record for health. Furnishing only 1 death in every sixty, or 16 deaths in every thousand of its population, while its adjoining ward on the south, the seventh, with a population of 31,267, contributes 1 death in every 38, or $26\frac{7}{100}$ in every thousand of its population. This unfavourable contrast with its northern neighbor, can readily be accounted for by the numerous imperfections that will be found to exist in its sanitary condition, particularly in its eastern, southern and south-western sections.

The ninth, thirteenth and fourteenth wards, with their combined population of 61,499, present also a very favourable record. They return 1 death to 51, or 19.80 in every thousand of their population.

ZYMOTIC DISEASES.—This class embraces those which belong to epidemics, endemics, and contagious diseases, and have their origin in causes which are specific and local, and considered as preventable wherever a careful attention is given to sanitary improvements. These are the diseases which carry off so many of our infant population, especially among the indigent, and those who are compelled to rear their offspring in the crowded sections of the city, where the provision for ventilation, light, and other sanitary arrangements, is defective in the extreme. The deaths from the diseases under this head, as may be seen by the accompanying table (Table V.), have amounted to 3506. Compared with those of 1861, the previous year, and they are less by 558, or 16 per cent.

TABLE V.—*Zymotic, Epidemic, Endemic, and Contagious Diseases, for* 1862.

Division 1. *Showing Sex and Age.*

| DISEASES. | TOTAL. | SEX. Males. | Females. | Boys. | Girls. | AGES. Under 1 year. | 1 to 2. | 2 to 5. | 5 to 10. | 10 to 15. | 15 to 20. | 20 to 30. | 30 to 40. | 40 to 50. | 50 to 60. | 60 to 70. | 70 to 80. | 80 to 90. | 90 to 100. | 100 to 110. | 110 to 120. | ADULTS. | MINORS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cholera | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| " infantum | 629 | 321 | 308 | 321 | 308 | 428 | 170 | 31 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 629 |
| " morbus | 58 | 26 | 32 | 6 | 5 | 4 | 3 | .. | 1 | 3 | .. | 4 | 8 | 4 | 6 | 10 | 12 | 3 | .. | .. | .. | 47 | 11 |
| Diarrhœa | 417 | 302 | 115 | 65 | 52 | 61 | 23 | 14 | 6 | .. | 13 | 133 | 54 | 31 | 38 | 20 | 15 | 8 | .. | 1 | .. | 300 | 117 |
| Diphtheria | 325 | 152 | 173 | 132 | 169 | 26 | 54 | 125 | 77 | 10 | 9 | 15 | 5 | 1 | 2 | .. | 1 | .. | .. | .. | .. | 24 | 301 |
| Dysentery | 163 | 98 | 65 | 43 | 31 | 20 | 38 | 9 | 3 | 1 | 3 | 22 | 30 | 13 | 6 | 8 | 6 | 4 | .. | .. | .. | 89 | 74 |
| Erysipelas | 74 | 42 | 32 | 25 | 21 | 26 | 5 | 7 | 3 | 3 | 2 | 6 | 5 | 5 | 5 | 3 | 2 | 2 | .. | .. | .. | 28 | 46 |
| Fever, congestive | 9 | 8 | 1 | 2 | .. | 1 | .. | .. | .. | 1 | .. | 2 | 2 | 1 | 1 | .. | 1 | .. | .. | .. | .. | 7 | 2 |
| " intermittent | 7 | 4 | 3 | .. | 2 | 1 | 1 | .. | .. | .. | .. | 3 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | 5 | 2 |
| " eruptive | 1 | 1 | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| " malignant | 2 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. |
| " remittent | 51 | 27 | 27 | 8 | 15 | 2 | 5 | 7 | 3 | 1 | 5 | 12 | 5 | 4 | 4 | 4 | 1 | 1 | .. | .. | .. | 31 | 23 |
| " scarlet | 461 | 222 | 239 | 220 | 236 | 35 | 82 | 228 | 101 | 8 | 2 | 3 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | 5 | 456 |
| " typhoid | 658 | 490 | 168 | 114 | 71 | 2 | 7 | 36 | 31 | 18 | 91 | 258 | 90 | 59 | 34 | 19 | 10 | 2 | 1 | .. | .. | 473 | 185 |
| " typhus | 37 | 18 | 19 | 7 | 5 | .. | .. | 3 | 5 | 1 | 3 | 5 | 9 | 7 | 3 | 1 | .. | .. | .. | .. | .. | 25 | 12 |
| " yellow | 2 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. |
| Hooping cough | 208 | 105 | 103 | 105 | 103 | 98 | 55 | 46 | 7 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 208 |
| Measles | 109 | 61 | 48 | 57 | 48 | 17 | 45 | 33 | 7 | 3 | .. | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 105 |
| Smallpox | 264 | 133 | 131 | 105 | 108 | 52 | 44 | 66 | 34 | 3 | 14 | 22 | 16 | 7 | 6 | .. | .. | .. | .. | .. | .. | 51 | 213 |
| Syphilis | 21 | 13 | 8 | 12 | 4 | 11 | 4 | 1 | .. | .. | .. | 1 | 2 | 1 | 1 | .. | .. | .. | .. | .. | .. | 5 | 16 |
| Thrush or aphthæ | 4 | 2 | 2 | 2 | 2 | 3 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 |
| Varicella | 2 | .. | 2 | .. | 2 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 |
| Total | 3506 | 2029 | 1477 | 1225 | 1182 | 787 | 538 | 608 | 278 | 52 | 144 | 494 | 231 | 133 | 106 | 65 | 48 | 20 | 1 | 1 | .. | 1099 | 2407 |

TABLE V.—*Zymotic, Epidemic, Endemic, and Contagious Diseases for* 1862—Continued.

Division 2. *Showing Location, Colour, Nativity, and Wards.*

| DISEASES. | Almshouse. | People of Colour. | Country. | Nativity. United States. | Nativity. Foreign. | Nativity. Unknown. | Wards. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | Unknown Wards. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cholera | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " Infantum | 2 | 20 | 10 | 623 | 5 | 1 | 64 | 37 | 26 | 22 | 11 | 13 | 41 | 16 | 9 | 17 | 20 | 19 | 14 | 18 | 30 | 25 | 32 | 18 | 51 | 43 | 13 | 13 | 16 | 28 | 12 | 8 |
| " morbus | .. | 3 | 3 | 33 | 21 | 4 | 4 | 7 | 2 | 3 | 2 | .. | 3 | 2 | 1 | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 5 | 1 | 1 | 1 | 2 | 1 | 1 | .. |
| Diarrhœa | 39 | 12 | 14 | 243 | 65 | 109 | 15 | 21 | 9 | 14 | 9 | 5 | 17 | 5 | 6 | 15 | 8 | 6 | 4 | 2 | 11 | 22 | 14 | 23 | 39 | 15 | 9 | 2 | 10 | 112 | 6 | 1 |
| Diphtheria | .. | 6 | 16 | 299 | 13 | 13 | 11 | 16 | 7 | 12 | 13 | 9 | 15 | 11 | 12 | 12 | 6 | 14 | 10 | 19 | 22 | 5 | 9 | 12 | 26 | 15 | .. | 13 | 20 | 12 | 5 | 3 |
| Dysentery | 1 | 5 | 6 | 103 | 38 | 22 | 17 | 12 | 2 | 7 | 2 | 3 | 22 | 3 | 2 | 4 | 2 | 5 | 2 | 3 | 7 | 4 | 7 | 7 | 10 | 6 | 3 | 6 | 4 | 11 | .. | 3 |
| Erysipelas | 8 | 3 | 3 | 57 | 9 | 8 | 5 | 5 | 1 | 1 | 2 | 1 | 4 | 4 | 1 | 3 | 2 | 2 | 2 | 2 | 4 | 5 | 1 | 3 | 4 | 5 | .. | 1 | .. | 12 | .. | 1 |
| Fever, congestive | .. | .. | 1 | 4 | 3 | 2 | 1 | 1 | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | .. | .. | .. | 1 | .. | .. |
| " intermittent | .. | 1 | 1 | 4 | 2 | 1 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. |
| " eruptive | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " malignant | .. | .. | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. |
| " remittent | 1 | 2 | 3 | 35 | 13 | 6 | 2 | 2 | 2 | .. | .. | 2 | 2 | 1 | 1 | 2 | 3 | .. | 2 | .. | 4 | 2 | 6 | 3 | 2 | 4 | 3 | 2 | 1 | 4 | 1 | .. |
| " scarlet | 7 | 7 | 17 | 410 | 3 | 18 | 30 | 30 | 22 | 19 | 14 | 9 | 36 | 19 | 10 | 13 | 7 | 9 | 15 | 23 | 41 | 12 | 17 | 19 | 22 | 20 | 6 | 46 | 2 | 38 | 2 | 2 |
| " typhoid | 3 | 16 | 68 | 396 | 127 | 135 | 31 | 34 | 11 | 17 | 14 | 12 | 45 | 12 | 7 | 48 | 11 | 41 | 18 | 13 | 25 | 25 | 17 | 20 | 51 | 42 | 17 | 8 | 16 | 42 | 8 | 2 |
| " typhus | .. | 1 | 1 | 22 | 15 | .. | .. | 4 | 3 | .. | 2 | .. | 1 | 1 | 1 | 1 | .. | 1 | .. | .. | 3 | .. | 3 | 2 | 8 | 4 | .. | .. | 1 | .. | .. | 1 |
| " yellow | .. | .. | .. | .. | 2 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Hooping cough | .. | 19 | 7 | 204 | 1 | 3 | 4 | 12 | 7 | 10 | 12 | 7 | 16 | 10 | 3 | 8 | 3 | 2 | 7 | 11 | 10 | 2 | 15 | 7 | 15 | 18 | 5 | 7 | 3 | 6 | 1 | .. |
| Measles | 1 | 2 | 2 | 104 | 1 | 4 | 8 | 7 | 6 | 7 | 2 | 4 | 6 | 4 | 2 | 2 | 8 | 2 | 3 | 2 | 7 | 5 | 3 | 1 | 9 | 4 | .. | 1 | 9 | 5 | .. | .. |
| Smallpox | .. | 4 | 1 | 236 | 17 | 11 | 39 | 25 | 12 | 11 | 6 | 2 | 9 | 4 | 6 | 3 | 12 | 5 | 3 | 5 | 10 | 12 | 13 | 6 | 24 | 13 | 15 | 12 | 1 | 7 | 4 | 4 |
| Syphilis | 13 | 2 | .. | 14 | .. | 7 | 1 | .. | .. | 1 | 2 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | 11 | .. | .. |
| Thrush or aphthæ | .. | .. | 1 | 4 | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Varicella | .. | .. | .. | 2 | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Total | 75 | 103 | 155 | 2825 | 336 | 345 | 238 | 216 | 112 | 125 | 92 | 68 | 219 | 93 | 61 | 132 | 86 | 107 | 81 | 100 | 181 | 122 | 141 | 125 | 271 | 192 | 72 | 71 | 85 | 296 | 40 | 25 |

There are, however, 526 of these deaths[1] that do not belong to our city mortality, having been brought here from the army. By deducting these, the deaths under this head will be reduced to 2980, or 1084 less than the former year, equal to 26.50 per cent.

To the total of deaths for the year, from all causes, these rate as 23 per cent., or one in every 4 and a third.

The falling off in the deaths from scarlet fever, smallpox, and diphtheria, has been 1050 from those in 1861.

This amount, however, has been made up in a great measure by the large increase of deaths from typhoid fever and diarrhœa. The former rose from 281, in 1861, to 658, and the latter from 183 to 417.

The heavy increase of mortality in these diseases can only be ascribed to deaths in the government hospitals, and to those brought here from the seat of war for interment.

The only disease named in this class, that has been increased in its mortality to any extent, over that of the former year, and cannot be attributed to foreign origin, has been hooping-cough, which has run up to 208 from 93. In every other disease, with the exception of those already named, there has been very little change.

Cholera infantum, as usual, has provided 629 deaths for the record, and unlike many other diseases where the deaths are distributed over the entire year, its mortality is confined to the three summer months of July, August, and September, at the same time selecting 327 or 50 per cent. of its innocent victims from the first, second, third, seventh, fifteenth, nineteenth and twentieth wards, which may be considered by far the most crowded and the most unsanitary sections of the city.

[1] The following catalogue has been obtained from the Registration Office. It gives the names of the diseases and casualties on the certificates of death of those soldiers of our army who have been buried in this city during the year 1862:—

| | | | | | |
|---|---|---|---|---|---|
| Typhoid fever, | 263 | Dropsy, | 9 | Inflammation of heart, | 1 |
| Wounds, gunshot, | 292 | Congestion of bowels, | 1 | Congestive fever, | 1 |
| Disease of the heart, | 11 | Tuberculosis, | 4 | Dyscrasia, | 1 |
| Peritonitis, | 7 | Congestion of lungs, | 1 | Erysipelas, | 4 |
| Diphtheria, | 16 | Disease of kidneys, | 2 | Scurvy, | 3 |
| Apoplexy, | 5 | Ossification of aortic valve, | 1 | Bronchitis, | 3 |
| Intermittent fever, | 2 | Compression of brain, | 1 | Cholera morbus, | 2 |
| Pleuro-pneumonia, | 9 | Abscess, | 4 | Marasmus, | 4 |
| Typhoid pneumonia, | 24 | Pleurisy, | 3 | Palsy, | 1 |
| Drowning, | 3 | Scarlet fever, | 1 | Hepatitis, | 1 |
| Consumption, | 88 | Rheumatism, | 1 | Larynx, | 1 |
| Brain fever, | 3 | Jaundice, | 1 | Concussion of brain, | 2 |
| Pneumonia, | 23 | Dysentery, | 40 | Gastric fever, | 1 |
| Inflammation of bowels, | 3 | Gangrene, | 6 | Parotitis, | 1 |
| Debility & exhaustion, | 34 | Tonsillitis, | 1 | Tetanus, | 1 |
| Convulsions, | 3 | Remittent fever, | 7 | Effusion on brain, | 1 |
| Ossification of arteries, | 1 | Disease of lungs, | 1 | Scrofula, | 1 |
| Inflammation of brain, | 6 | Pyemia, | 15 | Epilepsy, | 2 |
| Congestion of heart, | 1 | Bilious fever, | 1 | Murder, | 1 |
| Ulceration of bowels, | 4 | Falling from a window, | 1 | Scrofula, | 1 |
| Intemperance, | 3 | Diarrhœa, | 177 | Softening of the brain, | 2 |
| Dropsy of the chest, | 1 | Softening of brain, | 1 | Consumption of stomach, | 1 |
| Measles, | 3 | Accidents on railroad, | 13 | Trismus, | 1 |
| Variola, | 7 | Fever, pernicious, | 1 | Mania-a-potu, | 1 |
| Congestion of the brain, | 14 | Sunstroke, | 1 | Total, | 1,202 |
| Gastro-enteritis, | 8 | | | | |
| Unknown, | 35 | | | | |

Scarlet fever, smallpox, and diphtheria have prevailed during the year, but not to an alarming extent. During the first quarter, they furnished 437 deaths; in the second, 244; in the third, 154, and in the fourth, 215. These figures show a considerable decline in the second and third quarters, and although there was a slight increase in the fourth, they present a falling off of one-half from the first quarter. Smallpox fell off from 152 in the first quarter to 22 in the fourth. Scarlet fever, in the same period, from 189 to 92.

Diphtheria, however, appears to have increased during the last quarter. The first gave 96 deaths; the second, 56; the third, 72; while the fourth run up to 101.

TABLE A.—*Wards in which Zymotic or Epidemic Diseases were prevalent and deaths over* 150.

| Wards. | Population. | Total deaths. | Deaths from zymotics. |
|---|---|---|---|
| 1 | 30,886 | 1037 | 238 |
| 2 | 29,123 | 827 | 216 |
| 7 | 31,264 | 829 | 219 |
| 15 | 32,091 | 819 | 181 |
| 19 | 38,828 | 1042 | 271 |
| 20 | 29,963 | 736 | 192 |
| 24 | 23,738 | 660[1] | 221 |
| | 215,893 | 5950 | 1538 |
| From country | | | 155 |
| | | | 1693 |

TABLE B.—*Wards in which Zymotic or Epidemic Diseases have not prevailed extensively, and where the deaths were under* 150.

| Wards. | Population. | Total deaths. | Deaths from zymotics. |
|---|---|---|---|
| 3 | 19,929 | 491 | 112 |
| 4 | 23,461 | 711 | 125 |
| 5 | 24,792 | 520 | 92 |
| 6 | 14,882 | 350 | 68 |
| 8 | 27,770 | 465 | 93 |
| 9 | 17,196 | 338 | 61 |
| 10 | 21,849 | 599 | 132 |
| 11 | 16,681 | 384 | 86 |
| 12 | 16,681 | 429 | 107 |
| 13 | 20,045 | 380 | 81 |
| 14 | 24,258 | 493 | 100 |
| 16 | 20,067 | 520 | 122 |
| 17 | 23,264 | 677 | 141 |
| 18 | 20,441 | 596 | 125 |
| 21 | 17,159 | 284 | 72 |
| 22 | 17,173 | 286 | 71 |
| 23 | 23,985 | 329 | 85 |
| 25 | | 130 | 40 |
| Unknown | | 135 | 25 |
| | 349,643 | 8117 | 1738 |
| Almshouse | | | 75 |
| | | | 1813 |

The above tables have been prepared in order to furnish some idea of the healthy and unhealthy localities or wards in the city.

[1] Less those from almshouse 508.

In my last year's report I presented similar tables, in which the one marked A, analogous to that in this report, enumerated eleven wards, where deaths from epidemic diseases had exceeded one hundred and fifty. The table A, given above for 1862, recapitulates only six of these wards, the first, second, seventh, fifteenth, nineteenth and twentieth, to which I have added the twenty-fourth, where the deaths from zymotics were above one-hundred and fifty.

The decline of deaths from zymotic or preventable diseases in the remaining five of the eleven wards, as presented in table A, 1861, viz: the fourth, eleventh, sixteenth, seventeenth and eighteenth, may serve as an indication of the improved state of health in the city; nor have I any doubt, had it been practicable to have secured the deaths from zymotic diseases that have occurred in the government hospitals in our city, there being one in each of the above seven wards, and those that have been brought into the city from the seat of war and other places and buried from these wards, and deducted them from the total of deaths properly belonging to these wards, the figures would stand considerably below one hundred and fifty in each, making such a table unnecessary and effecting a sensible change in the index that pointed out these wards as the most unhealthy.

Table B embraces the remaining eighteen wards, together with the deaths from unknown wards. An average of the total of deaths in these eighteen sections—uniting the twenty-fifth and the unknown in one—will give 450 for each ward, while an average of the other seven wards makes the deaths 850 in each; thus showing the mortality to be nearly double. If we average the deaths from zymotic diseases in the seven wards, it returns 219 for each, and in the eighteen, the average will be 96 deaths.

This may not be the most accurate test of the health of one ward over another, as there may exist causes modifying unfavourably the mortality in one section over that of another, foreign to its sanitary condition, yet enough is learned to enable us to discriminate between the healthy and unhealthy districts.

The twenty-first, twenty-second and twenty-third wards, which are suburban, and to a large extent rural, furnished as high a rate of deaths from zymotic diseases as did several of the intramural wards with an equal population, and surrounded by far more adverse influences, incident to a residence in a crowded city. The cause of this mortality may be ascribed to the existence of malaria, which is to be found in most of the rural districts adjacent to our built up wards, where, during the autumnal season, there is abundance of decaying vegetable matter, together with numerous small sluggish streams of water and stagnant pools, on the unimproved lots, that create disease of an endemic character.

The fifth, eighth, ninth and twenty-third wards appear to have given only three deaths, from zymotic diseases, in every thousand of their population; the sixth, thirteenth, twenty-first and twenty-second wards contributed four in every thousand, while the remaining sixteen of the twenty-four, furnished a still higher proportion. It may, therefore, be assumed with entire safety, that the above named wards present a very favourable character for health, in comparison with other sections of the city. Three of them, it may be observed, are classed as rural districts.

The fact must not be overlooked that a large proportion of the deaths from this class of diseases, as a general rule, fall upon children and infants under five years of age. During the year under consideration, 1928 were

of this description, equal to 55 per cent. of the entire mortality. Of this number 784, or 22 per cent., were under one year of age.

The principal diseases of which these children died, were cholera infantum, diphtheria, diarrhœa, scarlet fever, hooping-cough, measles and smallpox.

Of this latter disease, there were in all 264 deaths, and of these 196, nearly two-thirds, were in children under ten years of age. This fact furnishes a strong appeal as to the necessity of an obligatory law for vaccination.

The deaths from smallpox were most numerous in the first, second, and nineteenth wards.

The deaths from diphtheria were distributed very generally through the city, except in the eleventh, sixteenth and twenty-first wards. The first two gave 6 and 5, but in the last named not a death is recorded.

Hooping-cough has prevailed to a greater extent during the year than usual. The first and the third quarters, the coldest and warmest seasons of the year, furnished the highest number of deaths.

The mortality for the year reached 208. This is the largest number of deaths that has ever been recorded in this city for any single year. In 1839 they reached 191, and in 1842, 197. Every other year, with the exception of 1844 and 1846, when they rose to 101 and 104, the mortality was quite small.

Measles has also been on the increase. The deaths having amounted to 109. Like diphtheria, the disease appears to have been very general through the city, if the deaths will serve as an index, but in the twenty-first, a rural ward, there is not a death recorded. There were four deaths in adults, three between 10 and 15 years, and the remainder under 10.

I have intentionally omitted the tables heretofore constructed, which designate the different varieties of sporadic diseases, and separate them into classes, according to the particular organs or parts of the system involved. In making minute investigations these tables are certainly useful, but as the diseases by name are to be found alphabetically arranged in the general table of deaths marked No. VI., they can be referred to for general purposes, and subdivided by those who take a special interest in mortality statistics.

In place of these classified divisions, I offer the following table of the most fatal sporadic causes of death which have occurred during the year, as well as during the previous year 1861. Inserting those causes only that rate above fifty in 1862, and comparing them with those of 1861.

*Deaths from Sporadic Causes in* 1862, *compared with those from similar causes in* 1861.

| | 1861. | 1862. | | 1861. | 1862. |
|---|---|---|---|---|---|
| Abscess | 47 | 52 | Gangrene | 46 | 55 |
| Apoplexy | 162 | 176 | Hemorrhage | 72 | 82 |
| Burns and scalds | 81 | 81 | Inflammation of Brain | 305 | 365 |
| Cancer (different varieties) | 189 | 181 | " of Bronchi | 138 | 116 |
| Casualties | 122 | 135 | " of Lungs | 681 | 749 |
| Croup | 304 | 258 | " of Peritoneum | 67 | 87 |
| Congestion of Brain | 275 | 324 | " of Stomach & Bowels | 238 | 306 |
| " of Lungs | 110 | 147 | Inanition | 124 | 125 |
| Convulsions | 636 | 703 | Intemperance | 29 | 82 |
| Consumption of the Lungs | 1817 | 1949 | Marasmus | 533 | 643 |
| Dropsy | 284 | 236 | Mania-à-Potu | 32 | 57 |
| " of Brain | 222 | 200 | Old Age | 203 | 219 |
| " of Chest | 63 | 55 | Palsy | 159 | 164 |
| Disease of Brain | 112 | 98 | Scrofula | 76 | 74 |
| " of Heart | 265 | 242 | Stillborn | 758 | 711 |
| Debility | 826 | 940 | Unknown | 104 | 97 |
| Drowned | 99 | 135 | Gunshot Wounds | 21 | 292 |
| Effusion of Brain | 73 | 69 | | | |

With few exceptions it will be observed that there is a degree of uniformity in the deaths from various causes, and this order is not peculiar to these two periods, it may be seen in the mortality of one year with another, in our own bills of mortality, likewise in those of other cities for a succession of years, and is only disturbed by an increase or decrease of the population.

The most marked inequality in any one cause between these two years is presented in that of gun-shot wounds, which figures 292 in 1862, and only 21 in 1861, which at that time was considered an extraordinary number. It needs no argument to prove from whence came this remarkable increase.

Another exception is that of debility, in which there is an increase of 110 in 1862, as also of consumption of the lungs, 132; intemperance, 53; inflammation of the lungs, 68; inflammation of the brain, 60; congestion of the brain, 40. Many of these may be traced directly to the record of causes for deaths among soldiers.

The similarity, as shown in this table, between the causes of death for the two years is remarkable in apoplexy, burns and scalds, casualties, diseases of the brain, debility, effusion of brain, inanition, old age, palsy, scrofula, cancer, and unknown.

The proportion of deaths by consumption to those of other diseases, has been one in $7\frac{1}{2}$, and the percentage to all other deaths 12.71.

To the population, estimating it at 600,000, they were as one in every 308.

The excess of deaths is with females. The most prevalent age for deaths from consumption is between twenty and thirty. It carried off in 1862 in this decennial 608 persons. More than one-half of all the deaths occurred between the ages of fifteen and forty.

The first, second, fourth, seventh, tenth, fifteenth, nineteenth and twentieth wards are charged with 881 deaths from consumption, more than one-half the entire mortality, and these wards are with but one exception the tenth among the most unfavourable for health.

The almshouse furnished 124 deaths, and the coloured population is set down for 149 deaths from consumption.

The mortality assigned to debility, intemperance, mania-a-potu and in-

flammation of the brain, have all increased more or less, while on the other hand croup, dropsy (general and of the brain and chest), and disease of the heart have shown a moderate decline.

There are to be found certain variations in the mortality record for 1862 from that of 1861, and even of earlier years, which depend in some measure upon the rebellion and its results, that are deserving of a passing notice. They are as follows :—

1. The increase in the annual aggregate of deaths, without the prevalence of any unusual epidemic.

2. The unusual mortality among males, as compared with those of females, equal to 23 per cent., and presenting an excess more than double the usual number.

3. The limited proportion of deaths of minors or children to those of adults, not over 14 per cent. The previous year they exceeded 64 per cent.

4. The astonishing increase in the deaths from gun-shot wounds. From 21 of the preceding year to 292 !

5. The increased mortality from typhoid fever, amounting to 658, or 477 above those of 1861, equal to 170 per cent. The excess in all probability was from the deaths of soldiers.

6. The falling off in the deaths from scarlet fever, smallpox, and diphtheria, when compared with those for 1861, amounting in the aggregate to 1397, or 57 per cent.

7. The unusual annual increase in the deaths from consumption of the lungs and debility. The former amounting to 132 or 7 per cent., and the latter to 112 or 13 per cent.

8. The large number of the remains of soldiers brought into our city for interment, amounting to 1202, causing our rate of mortality to appear higher by 4 per cent. than belongs to it.

9. The organization of 22 government hospitals in our city, where there have been treated during the year 20,336 sick and wounded soldiers from the seat of war, thus swelling our list of city deaths—one for every death in these hospitals amounting to 700.

**TABLE VI.**—*Interments in the City of Philadelphia from December 28, 1861, to January 3, 1863.*

Division 1. *Mortality classified according to Sex and Age.*

| DISEASES. | TOTAL. | SEX. | | | | AGES. | | | | | | | | | | | | | | | | ADULTS. | MINORS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Males. | Females. | Boys. | Girls. | Under 1 year. | 1 to 2. | 2 to 5. | 5 to 10. | 10 to 15. | 15 to 20. | 20 to 30. | 30 to 40. | 40 to 50. | 50 to 60. | 60 to 70. | 70 to 80 | 80 to 90. | 90 to 100. | 100 to 110. | 110 to 120. | | |
| Abortion | 3 | 2 | 1 | 2 | 1 | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 |
| Abscess | 52 | 30 | 22 | 7 | 4 | 2 | 2 | 2 | 2 | 1 | 2 | 9 | 11 | 9 | 4 | 6 | 1 | .. | 1 | .. | .. | 41 | 11 |
| Albuminuria | 10 | 85 | 5 | 1 | .. | .. | .. | .. | .. | 1 | .. | 1 | 2 | 1 | 1 | 2 | 1 | 1 | .. | .. | .. | 9 | 1 |
| Anæmia | 20 | 12 | 8 | 8 | 4 | 9 | .. | 2 | .. | 1 | .. | 2 | 1 | .. | 3 | 1 | 1 | .. | .. | .. | .. | 8 | 12 |
| Aneurism | 13 | 11 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 2 | 5 | 2 | 3 | .. | .. | .. | .. | .. | 13 | .. |
| Anthrax | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Angina pectoris | 11 | 8 | 3 | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | 3 | 5 | 1 | .. | .. | .. | .. | 10 | 1 |
| Amputation | 4 | 4 | .. | 2 | .. | .. | .. | .. | 1 | .. | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 2 |
| Aphthæ | 4 | 2 | 2 | 2 | 2 | 3 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 |
| Apoplexy | 176 | 93 | 83 | 6 | 3 | 2 | .. | 1 | .. | .. | 6 | 9 | 12 | 30 | 33 | 39 | 34 | 10 | .. | .. | .. | 167 | 9 |
| Asphyxia | 35 | 18 | 17 | 16 | 14 | 28 | .. | 2 | .. | .. | .. | 1 | 1 | 1 | 1 | .. | 1 | .. | .. | .. | .. | 5 | 30 |
| Asthma | 24 | 15 | 9 | 4 | 1 | 2 | 1 | 1 | 1 | .. | .. | .. | .. | .. | 6 | 3 | 9 | 1 | .. | .. | .. | 19 | 5 |
| Burns and scalds | 81 | 38 | 43 | 25 | 34 | 3 | 7 | 27 | 9 | 3 | 10 | 9 | 7 | 2 | 1 | 1 | 2 | .. | .. | .. | .. | 22 | 59 |
| Cancer | 70 | 28 | 42 | 2 | 2 | 1 | .. | .. | 2 | .. | 1 | 3 | 7 | 15 | 16 | 14 | 8 | 3 | .. | .. | .. | 66 | 4 |
| " of the breast | 12 | .. | 12 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 2 | 5 | 2 | .. | .. | .. | .. | 12 | .. |
| " " chest | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. |
| " " heart | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. |
| " " neck | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. |
| " " ovaries | 1 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| " " stomach & bowels | 65 | 31 | 34 | 5 | .. | .. | 2 | 3 | .. | .. | .. | 2 | 4 | 11 | 15 | 17 | 8 | 3 | .. | .. | .. | 60 | 5 |
| " " uterus | 30 | .. | 30 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | 6 | 17 | 2 | .. | .. | .. | .. | .. | 30 | .. |
| Casualties | 135 | 116 | 19 | 36 | 7 | 1 | 3 | 9 | 9 | 7 | 14 | 29 | 17 | 15 | 17 | 8 | 4 | 2 | .. | .. | .. | 92 | 43 |
| Croup | 258 | 137 | 121 | 134 | 119 | 31 | 53 | 133 | 33 | 1 | 2 | 1 | .. | .. | 1 | 2 | 1 | .. | .. | .. | .. | 5 | 253 |
| Congestion | 3 | 2 | 1 | 2 | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | 2 |
| " of the brain | 324 | 169 | 155 | 103 | 116 | 77 | 47 | 49 | 28 | 9 | 9 | 23 | 28 | 20 | 13 | 11 | 8 | 2 | .. | .. | .. | 105 | 219 |
| " " bowels | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| " " heart | 2 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 2 | .. |
| " " liver | 10 | 5 | 5 | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | 1 | 2 | .. | 3 | 3 | .. | .. | .. | .. | 9 | 1 |
| " " lungs | 147 | 83 | 64 | 53 | 40 | 42 | 17 | 15 | 12 | 3 | 4 | 7 | 9 | 7 | 6 | 12 | 11 | 1 | 1 | .. | .. | 54 | 93 |
| Convulsions | 703 | 361 | 342 | 339 | 324 | 395 | 115 | 119 | 28 | 6 | .. | 11 | 13 | 7 | 4 | 3 | 2 | .. | .. | .. | .. | 40 | 663 |
| " puerperal | 46 | .. | 46 | .. | 3 | .. | .. | .. | .. | .. | 3 | 21 | 16 | 3 | .. | .. | .. | .. | .. | .. | .. | 43 | 3 |
| Consumption of bowels | 23 | 10 | 13 | 6 | 5 | 2 | 3 | 1 | 1 | .. | 4 | 3 | 4 | 1 | 1 | 1 | 1 | 1 | .. | .. | .. | 12 | 11 |
| " lungs | 1949 | 961 | 988 | 121 | 169 | 45 | 27 | 36 | 32 | 26 | 127 | 608 | 445 | 269 | 172 | 103 | 51 | 8 | .. | .. | .. | 1656 | 293 |
| Carbuncle | 5 | 3 | 2 | .. | 2 | .. | 1 | 1 | .. | .. | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 3 | 2 |
| Compression of the brain | 11 | 6 | 5 | 2 | 2 | 1 | .. | 1 | 1 | 1 | .. | 1 | 2 | .. | 1 | 2 | 1 | .. | .. | .. | .. | 7 | 4 |
| Cyanosis | 40 | 25 | 15 | 25 | 15 | 39 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 40 |
| Cirrhosis | 15 | 9 | 6 | 1 | 1 | 1 | .. | .. | 1 | .. | .. | .. | 1 | 5 | 3 | 3 | 1 | .. | .. | .. | .. | 13 | 2 |

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 1. *Mortality classified according to Sex and Age.*

| DISEASES. | TOTAL. | SEX. Males. | Females. | Boys. | Girls. | AGES. Under 1 year. | 1 to 2. | 2 to 5. | 5 to 10. | 10 to 15. | 15 to 20. | 20 to 30. | 30 to 40. | 40 to 50. | 50 to 60. | 60 to 70. | 70 to 80. | 80 to 90. | 90 to 100. | 100 to 110. | 110 to 120. | ADULTS. | MINORS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concussion of the brain | 13 | 11 | 2 | 4 | 2 | 1 | .. | .. | 2 | 1 | 2 | 3 | 1 | 1 | .. | 2 | .. | .. | .. | .. | .. | 7 | 6 |
| Cholera asphyxia | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| " infantum | 629 | 321 | 308 | 321 | 308 | 428 | 170 | 31 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 629 |
| " morbus | 58 | 26 | 32 | 6 | 5 | 4 | 3 | .. | 1 | 3 | .. | 4 | 8 | 4 | 6 | 10 | 12 | 3 | .. | .. | .. | 47 | 11 |
| Cramps | 17 | 9 | 8 | 9 | 7 | 13 | .. | 1 | 1 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 16 |
| Caries of spine | 6 | 3 | 3 | 2 | 2 | .. | .. | .. | 2 | 2 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 4 |
| " bones of the face | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| Chicken-pox | 2 | .. | 2 | .. | 2 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 |
| Contusion of chest | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. |
| Colic | 6 | 3 | 3 | 1 | 2 | 2 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | 3 | 3 |
| Coxalgia | 7 | 3 | 4 | 1 | 4 | .. | .. | .. | 1 | 2 | 2 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 2 | 5 |
| Constipation | 2 | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | 1 |
| Coryza | 1 | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| Coup de soleil | 24 | 22 | 2 | 1 | .. | .. | .. | 1 | .. | .. | .. | 4 | 7 | 7 | 1 | 4 | .. | .. | .. | .. | .. | 23 | 1 |
| Diphtheria | 325 | 152 | 173 | 132 | 169 | 26 | 54 | 125 | 77 | 10 | 9 | 15 | 5 | 1 | 2 | .. | 1 | .. | .. | .. | .. | 24 | 301 |
| Dropsy | 236 | 96 | 140 | 35 | 21 | 4 | 2 | 25 | 12 | 8 | 5 | 12 | 27 | 23 | 33 | 40 | 27 | 15 | 3 | .. | .. | 180 | 56 |
| " abdominal | 26 | 13 | 13 | 1 | .. | .. | .. | .. | 1 | .. | .. | 2 | 6 | 4 | 4 | 6 | 3 | .. | .. | .. | .. | 25 | 1 |
| " of the brain | 200 | 100 | 100 | 98 | 99 | 97 | 56 | 37 | 3 | 3 | 1 | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | .. | 3 | 197 |
| " " chest | 55 | 34 | 21 | 10 | 4 | .. | 1 | 5 | 5 | 3 | .. | 6 | 4 | 4 | 13 | 6 | 7 | .. | 1 | .. | .. | 41 | 14 |
| " " heart | 45 | 24 | 21 | 5 | 7 | 1 | .. | 4 | 2 | 3 | 2 | 3 | 5 | 5 | 6 | 6 | 7 | 1 | .. | .. | .. | 33 | 12 |
| " " ovaries | 4 | .. | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 2 | .. | 1 | .. | .. | .. | .. | 4 | .. |
| " " stomach | 3 | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | 1 | .. | .. | .. | .. | 3 | .. |
| Disease of the brain | 98 | 48 | 50 | 28 | 35 | 21 | 15 | 17 | 5 | 2 | 3 | 7 | 6 | 5 | 6 | 5 | 5 | 1 | .. | .. | .. | 35 | 63 |
| " " bladder | 7 | 6 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 2 | 1 | 3 | .. | .. | .. | .. | 7 | .. |
| " " chest | 5 | 5 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | 2 | 1 | .. | .. | .. | .. | .. | .. | 5 | .. |
| " " heart | 242 | 123 | 119 | 30 | 20 | 12 | 5 | 7 | 5 | 8 | 13 | 28 | 22 | 38 | 29 | 39 | 31 | 4 | 1 | .. | .. | 192 | 50 |
| " " kidneys | 31 | 17 | 14 | 1 | 1 | .. | .. | .. | .. | .. | 2 | 5 | 4 | 6 | 3 | 5 | 6 | .. | .. | .. | .. | 29 | 2 |
| " " lungs | 20 | 10 | 10 | 2 | 7 | 3 | 1 | 3 | 1 | .. | 1 | 2 | 2 | 1 | 3 | 2 | 1 | .. | .. | .. | .. | 11 | 9 |
| " " liver | 43 | 24 | 19 | 1 | 2 | .. | 1 | .. | 1 | .. | 1 | 1 | 9 | 8 | 12 | 5 | 5 | .. | .. | .. | .. | 40 | 3 |
| " " spine | 22 | 6 | 16 | 4 | 12 | 6 | .. | 1 | 5 | 2 | 2 | .. | 2 | 1 | 1 | 2 | .. | .. | .. | .. | .. | 6 | 16 |
| " " glands | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| " " stomach & bowels | 15 | 10 | 5 | 3 | 1 | 3 | .. | 1 | .. | .. | .. | 1 | .. | .. | 2 | 4 | 4 | .. | .. | .. | .. | 11 | 4 |
| " " skin | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| " " throat | 9 | 2 | 7 | 2 | 5 | 1 | 2 | 2 | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | 7 |
| " " uterus | 4 | .. | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | 1 | .. | 1 | .. | .. | .. | .. | 4 | .. |
| Diarrhœa | 417 | 302 | 115 | 65 | 52 | 61 | 23 | 14 | 6 | .. | 13 | 133 | 54 | 31 | 38 | 20 | 15 | 8 | .. | 1 | .. | 300 | 117 |
| Debility | 910 | 487 | 453 | 225 | 181 | 330 | 25 | 25 | 10 | 7 | 9 | 49 | 74 | 60 | 55 | 96 | 118 | 69 | 12 | .. | 1 | 534 | 406 |

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 1. *Mortality classified according to Sex and Age.*

| DISEASES. | TOTAL. | SEX. Males. | Females. | Boys. | Girls. | AGES. Under 1 year. | 1 to 2. | 2 to 5. | 5 to 10. | 10 to 15. | 15 to 20. | 20 to 30. | 30 to 40. | 40 to 50. | 50 to 60. | 60 to 70. | 70 to 80. | 80 to 90. | 90 to 100. | 100 to 110. | 110 to 120. | ADULTS. | MINORS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dysentery | 163 | 98 | 65 | 43 | 31 | 20 | 38 | 9 | 3 | 1 | 3 | 22 | 30 | 13 | 6 | 8 | 6 | 4 | .. | .. | .. | 89 | 74 |
| Drowned | 135 | 118 | 17 | 47 | 11 | 1 | .. | 4 | 20 | 17 | 16 | 18 | 27 | 22 | 7 | 3 | .. | .. | .. | .. | .. | 77 | 58 |
| Diabetes | 10 | 5 | 5 | 1 | .. | .. | .. | .. | .. | .. | 1 | 1 | 4 | 1 | 1 | 1 | 1 | .. | .. | .. | .. | 9 | 1 |
| Dyspepsia | 2 | 1 | 1 | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | 1 |
| Dislocation of spine | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. |
| Dysuria | 1 | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| Effusion of the brain | 69 | 43 | 26 | 32 | 21 | 21 | 19 | 12 | 2 | .. | 2 | 3 | 1 | 2 | 5 | .. | 2 | .. | .. | .. | .. | 13 | 56 |
| " " lungs | 6 | 2 | 4 | 1 | 4 | .. | 2 | 1 | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 5 |
| Epilepsy | 28 | 19 | 9 | .. | 3 | .. | .. | .. | 1 | 1 | 1 | 11 | 7 | 4 | 2 | .. | .. | 1 | .. | .. | .. | 25 | 3 |
| Erysipelas | 74 | 42 | 32 | 25 | 21 | 26 | 5 | 7 | 3 | 3 | 2 | 6 | 5 | 5 | 5 | 3 | 2 | 2 | .. | .. | .. | 28 | 46 |
| Emphysema of lungs | 2 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | 2 | .. |
| Enlargement of the heart | 5 | 2 | 3 | .. | 1 | .. | .. | .. | 1 | .. | .. | 2 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | 4 | 1 |
| " " liver | 5 | 4 | 1 | 1 | .. | .. | 1 | .. | .. | .. | .. | 1 | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | 4 | 1 |
| " " prostate gland | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. |
| Exposure | 4 | 3 | 1 | 3 | .. | 1 | .. | .. | .. | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 3 |
| Empyema | 1 | .. | 1 | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| Ecthyma | 1 | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| Fever | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| " bilious | 23 | 15 | 8 | 4 | 2 | 1 | .. | .. | 1 | 1 | 3 | 6 | 5 | 3 | 3 | .. | .. | .. | .. | .. | .. | 17 | 6 |
| " brain | 18 | 11 | 7 | 4 | 7 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | .. | .. | .. | .. | .. | .. | .. | 7 | 11 |
| " congestive | 8 | 7 | 1 | 1 | .. | .. | 1 | .. | .. | .. | .. | 2 | 2 | 1 | 1 | .. | 1 | .. | .. | .. | .. | 7 | 1 |
| " camp | 4 | 4 | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 1 |
| " catarrh | 2 | 1 | 1 | 1 | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 |
| " eruptive | 1 | 1 | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| " gastric | 7 | 3 | 4 | 1 | 2 | .. | 2 | 1 | .. | .. | .. | 1 | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | 4 | 3 |
| " hectic | 4 | 2 | 2 | .. | 2 | 2 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 2 | 2 |
| " intermittent | 7 | 4 | 3 | .. | 2 | 1 | 1 | .. | .. | .. | .. | 3 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | 5 | 2 |
| " puerperal | 23 | .. | 23 | .. | .. | .. | .. | .. | .. | .. | .. | 8 | 13 | 2 | .. | .. | .. | .. | .. | .. | .. | 23 | .. |
| " rheumatic | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| " malignant | 2 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. |
| " remittent | 24 | 9 | 15 | 3 | 11 | 1 | 3 | 6 | 2 | .. | 2 | 5 | .. | .. | 1 | 3 | .. | 1 | .. | .. | .. | 10 | 14 |
| " scarlet | 461 | 222 | 239 | 220 | 236 | 35 | 82 | 228 | 101 | 8 | 2 | 3 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | 5 | 456 |
| " typhoid | 654 | 486 | 168 | 113 | 71 | 2 | 7 | 36 | 31 | 18 | 90 | 255 | 90 | 59 | 31 | 19 | 10 | 2 | 1 | .. | .. | 470 | 184 |
| " typhus | 37 | 18 | 19 | 7 | 5 | .. | .. | 3 | 5 | 1 | 3 | 5 | 9 | 7 | 3 | 1 | .. | .. | .. | .. | .. | 25 | 12 |
| " yellow | 2 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. |
| Fracture of the arm | 2 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. |
| " " leg | 8 | 8 | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | 3 | .. | 2 | 2 | .. | .. | .. | .. | .. | 7 | 1 |

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division I. *Mortality classified according to Sex and Age.*

| DISEASES. | TOTAL. | SEX. | | | | AGES. | | | | | | | | | | | | | | | | ADULTS. | MINORS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Males. | Females. | Boys. | Girls. | Under 1 year. | 1 to 2. | 2 to 5. | 5 to 10. | 10 to 15. | 15 to 20. | 20 to 30. | 30 to 40. | 40 to 50. | 50 to 60. | 60 to 70. | 70 to 80. | 80 to 90. | 90 to 100. | 100 to 110. | 110 to 120. | | |
| Fracture of the skull | 11 | 9 | 2 | 2 | 1 | .. | .. | 1 | 1 | .. | 1 | 3 | .. | 4 | 1 | .. | .. | .. | .. | .. | .. | 8 | 3 |
| " " shoulder | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| " " thigh | 6 | 6 | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 3 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 5 | 1 |
| " " pelvis | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Fistula | 2 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | 2 | .. |
| Fatty degeneration of heart | 3 | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | 1 | .. | .. | .. | .. | .. | 3 | .. |
| " " kidneys | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. |
| " " liver | 2 | 2 | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | 1 |
| Gangrene | 55 | 27 | 28 | 6 | 9 | 3 | 4 | 3 | 2 | 1 | 2 | 6 | 1 | 5 | 6 | 9 | 8 | 5 | .. | .. | .. | 40 | 15 |
| Gout | 5 | 4 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | 2 | .. | 1 | .. | .. | 5 | .. |
| Gravel | 2 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | 2 | .. |
| Hernia | 14 | 8 | 6 | 3 | .. | 3 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 7 | 3 | .. | .. | .. | .. | 11 | 3 |
| Hydrophobia | 4 | 3 | 1 | 2 | 1 | .. | .. | 1 | 2 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 3 |
| Hooping-cough | 208 | 105 | 103 | 105 | 103 | 98 | 55 | 46 | 7 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 208 |
| Hemorrhage | 82 | 48 | 34 | 17 | 18 | 13 | 4 | 7 | 4 | 5 | 2 | 12 | 11 | 5 | 7 | 6 | 4 | 2 | .. | .. | .. | 47 | 35 |
| " of the lungs | 21 | 11 | 10 | 1 | 2 | 1 | .. | .. | .. | 1 | 1 | 4 | 9 | 1 | 2 | 1 | 1 | .. | .. | .. | .. | 18 | 3 |
| " kidneys | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. |
| " stomach & bowels | 8 | 5 | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | .. | 3 | .. | 1 | .. | .. | .. | 8 | .. |
| " uterus | 13 | .. | 13 | .. | .. | .. | .. | .. | .. | .. | .. | 5 | 5 | 2 | .. | .. | 1 | .. | .. | .. | .. | 13 | .. |
| Inflammation | 6 | 1 | 5 | 1 | 3 | 1 | 1 | 2 | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 2 | 4 |
| " of brain | 365 | 218 | 147 | 180 | 138 | 91 | 78 | 89 | 39 | 15 | 6 | 10 | 14 | 17 | 2 | 2 | 2 | .. | .. | .. | .. | 47 | 318 |
| " bronchi | 116 | 57 | 59 | 37 | 29 | 34 | 20 | 10 | 1 | .. | 1 | 3 | 8 | 8 | 7 | 12 | 7 | 5 | .. | .. | .. | 50 | 66 |
| " breast | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| " bladder | 15 | 10 | 5 | .. | 1 | .. | .. | .. | .. | .. | 1 | 1 | 2 | .. | 4 | 2 | 5 | .. | .. | .. | .. | 14 | 1 |
| " chest | 1 | 1 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| " ear | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| " heart | 28 | 19 | 9 | 3 | 1 | .. | .. | 1 | 3 | .. | .. | 9 | 6 | 2 | 2 | .. | 4 | 1 | .. | .. | .. | 24 | 4 |
| " kidneys | 5 | 4 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 2 | 1 | .. | .. | 1 | .. | .. | 5 | .. |
| " lungs | 749 | 413 | 336 | 241 | 241 | 212 | 115 | 117 | 22 | 6 | 10 | 64 | 46 | 44 | 33 | 41 | 27 | 12 | .. | .. | .. | 267 | 482 |
| " liver | 38 | 18 | 20 | .. | 2 | .. | .. | 2 | .. | .. | .. | 4 | 6 | 12 | 7 | 4 | 2 | 1 | .. | .. | .. | 36 | 2 |
| " larynx | 22 | 8 | 14 | 6 | 9 | 4 | 5 | 5 | 1 | .. | .. | 2 | 3 | .. | 1 | .. | 1 | .. | .. | .. | .. | 7 | 15 |
| " peritoneum | 87 | 41 | 46 | 13 | 8 | 5 | 2 | 4 | 1 | 5 | 4 | 20 | 18 | 7 | 9 | 6 | 3 | 3 | .. | .. | .. | 66 | 21 |
| " prostate gland | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. |
| " pleura | 20 | 14 | 6 | 4 | .. | 2 | .. | 1 | 1 | .. | .. | 7 | 1 | 1 | 1 | 2 | 1 | 3 | .. | .. | .. | 16 | 4 |
| " parotid glands | 5 | 2 | 3 | 1 | 3 | 1 | .. | 2 | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 4 |
| " pharynx | 1 | 1 | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| " stomach & bowels | 306 | 148 | 158 | 72 | 73 | 64 | 32 | 24 | 15 | 6 | 4 | 34 | 31 | 31 | 25 | 22 | 13 | 5 | .. | .. | .. | 161 | 145 |

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 1. *Mortality classified according to Sex and Age.*

| DISEASES. | TOTAL. | SEX. | | | | AGES. | | | | | | | | | | | | | | | | ADULTS. | MINORS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Males. | Females. | Boys. | Girls. | Under 1 year. | 1 to 2. | 2 to 5. | 5 to 10. | 10 to 15. | 15 to 20. | 20 to 30. | 30 to 40. | 40 to 50. | 50 to 60. | 60 to 70. | 70 to 80. | 80 to 90. | 90 to 100. | 100 to 110. | 110 to 120. | | |
| Inflammation of spine | 7 | 5 | 2 | 5 | 1 | .. | 1 | 1 | 4 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | 6 |
| " spleen | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| " throat | 1 | .. | 1 | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| " tonsils | 1 | 1 | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| " uterus | 7 | .. | 7 | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 2 | 2 | .. | .. | .. | .. | .. | .. | .. | 7 | .. |
| " veins | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Inanition | 125 | 73 | 52 | 51 | 39 | 77 | 2 | 3 | 1 | 1 | 6 | 14 | 6 | 3 | 3 | 3 | 6 | .. | .. | .. | .. | 35 | 90 |
| Insanity | 8 | 3 | 5 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | 2 | 3 | 1 | .. | .. | .. | .. | .. | 8 | .. |
| Jaundice | 27 | 13 | 14 | 4 | 7 | 8 | 1 | 1 | 1 | .. | .. | 1 | 3 | 5 | 2 | 4 | .. | 1 | .. | .. | .. | 16 | 11 |
| Intemperance and exposure | 82 | 45 | 37 | .. | .. | .. | .. | .. | .. | .. | .. | 14 | 34 | 23 | 6 | 4 | 1 | .. | .. | .. | .. | 82 | .. |
| Icterus | 6 | 1 | 5 | .. | 5 | 4 | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 5 |
| Leucocythemia | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Marasmus | 643 | 356 | 287 | 328 | 261 | 326 | 150 | 90 | 21 | 5 | .. | 4 | 6 | 5 | 7 | 16 | 11 | 1 | .. | 1 | .. | 51 | 592 |
| Measles | 109 | 61 | 48 | 57 | 48 | 17 | 45 | 33 | 7 | 3 | .. | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 105 |
| Mania a potu | 57 | 46 | 11 | .. | .. | .. | .. | .. | .. | .. | .. | 8 | 17 | 20 | 10 | .. | 2 | .. | .. | .. | .. | 57 | .. |
| Malformation | 20 | 13 | 7 | 13 | 7 | 19 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 20 |
| Metastasis | 1 | .. | 1 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| Melanosis | 2 | .. | 2 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | 1 |
| Neuralgia | 10 | 4 | 6 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | 2 | 2 | 2 | 1 | 1 | .. | .. | .. | 10 | .. |
| Neglect | 1 | 1 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| Neurosis | 5 | 2 | 3 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | 2 | 2 | .. | .. | .. | .. | .. | .. | .. | 4 | 1 |
| Necrosis | 2 | 1 | 1 | .. | 1 | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 |
| Old age | 219 | 69 | 150 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 10 | 57 | 105 | 39 | 4 | .. | 219 | .. |
| Obstruction of the bowels | 24 | 10 | 14 | 6 | 1 | 5 | .. | .. | .. | 2 | .. | 2 | 3 | 4 | .. | 2 | 1 | .. | .. | .. | .. | 17 | 7 |
| Overdose of ether | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Ossification of the heart | 8 | 5 | 3 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 2 | 2 | 1 | 2 | .. | .. | .. | 8 | .. |
| " " aorta | 4 | 3 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | 1 | .. | .. | .. | 4 | .. |
| Œdema of the glottis | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Palsy | 164 | 74 | 90 | 4 | .. | .. | .. | 1 | 2 | .. | 1 | 5 | 9 | 15 | 26 | 30 | 51 | 17 | 7 | .. | .. | 160 | 4 |
| Pyæmia | 29 | 26 | 3 | 4 | .. | 1 | .. | .. | .. | .. | 3 | 16 | 5 | 1 | 2 | .. | 1 | .. | .. | .. | .. | 25 | 4 |
| Purpura | 6 | 4 | 2 | 2 | 1 | 1 | .. | 1 | 1 | .. | .. | .. | 2 | .. | 1 | .. | .. | .. | .. | .. | .. | 3 | 3 |
| Poisoning | 6 | 4 | 2 | 2 | 2 | 2 | .. | .. | 1 | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | 2 | 4 |
| Rupia | 1 | 1 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| Rheumatism | 20 | 11 | 9 | 4 | .. | .. | .. | 1 | .. | 1 | 2 | 5 | 2 | 2 | 2 | 4 | 1 | .. | .. | .. | .. | 16 | 4 |
| Rupture | 1 | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| " of the uterus | 3 | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | 3 | .. |
| " " aorta | 2 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | 2 | .. |

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 1. *Mortality classified according to Sex and Age.*

| DISEASES. | TOTAL. | SEX. Males. | Females. | Boys. | Girls. | AGES. Under 1 year. | 1 to 2. | 2 to 5. | 5 to 10. | 10 to 15. | 15 to 20. | 20 to 30. | 30 to 40. | 40 to 50. | 50 to 60. | 60 to 70. | 70 to 80. | 80 to 90. | 90 to 100. | 100 to 110. | 110 to 120. | ADULTS. | MINORS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Scrofula | 71 | 44 | 30 | 39 | 27 | 16 | 15 | 15 | 11 | 3 | 6 | 4 | 1 | 2 | .. | .. | 1 | .. | .. | .. | .. | 8 | 63 |
| Smallpox | 264 | 133 | 131 | 105 | 108 | 52 | 44 | 66 | 31 | 3 | 14 | 22 | 16 | 7 | 6 | .. | .. | .. | .. | .. | .. | 51 | 213 |
| Softening of the brain | 43 | 26 | 17 | 3 | 2 | .. | 2 | 1 | .. | .. | 2 | 2 | 10 | 5 | 8 | 5 | 6 | 2 | .. | .. | .. | 38 | 5 |
| " " heart | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. |
| Stillborn | 711 | 414 | 297 | 414 | 297 | 711 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 711 |
| Syphilis | 21 | 13 | 8 | 12 | 4 | 11 | 4 | 1 | .. | .. | .. | 1 | 2 | 1 | 1 | .. | .. | .. | .. | .. | .. | 5 | 16 |
| Suicide | 14 | 11 | 3 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 3 | 7 | .. | 3 | .. | .. | .. | .. | .. | 14 | .. |
| Suffocation | 13 | 8 | 5 | 3 | 5 | 5 | .. | 1 | 2 | .. | .. | 1 | .. | 2 | 2 | .. | .. | .. | .. | .. | .. | 5 | 8 |
| Stricture of the œsophagus | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. |
| " " pylorus | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. |
| " " glottis | 1 | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| Strangulation | 3 | 3 | .. | 3 | .. | 1 | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 |
| Suffocating catarrh | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. |
| Syncope | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Scurvy | 5 | 5 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 5 | .. |
| Tumours | 21 | 2 | 19 | .. | 1 | .. | .. | .. | 1 | .. | .. | 5 | 4 | 3 | 3 | 3 | 2 | .. | .. | .. | .. | 20 | 1 |
| Tympanitis | 2 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 2 | .. |
| Tetanus | 27 | 19 | 8 | 11 | 6 | 4 | 1 | .. | 5 | 3 | 4 | 3 | 2 | 2 | 1 | 1 | 1 | .. | .. | .. | .. | 10 | 17 |
| Teething | 41 | 23 | 18 | 23 | 18 | 20 | 20 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 41 |
| Unknown | 97 | 71 | 26 | 15 | 14 | 22 | 3 | 1 | 1 | 1 | 1 | 32 | 12 | 9 | 2 | 5 | 5 | 3 | .. | .. | .. | 68 | 20 |
| Ulceration | 6 | 2 | 4 | 1 | 1 | 1 | .. | .. | 1 | .. | .. | .. | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | 4 | 2 |
| " of the bowels | 21 | 13 | 8 | 2 | 4 | 1 | 2 | 1 | .. | 1 | 1 | .. | 5 | 7 | 2 | 1 | .. | .. | .. | .. | .. | 15 | 6 |
| " " bladder | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. |
| " " larynx | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| " " stomach | 3 | 2 | 1 | 2 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | 2 |
| " " throat | 4 | 2 | 2 | 1 | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 2 | 2 |
| Violence | 7 | 6 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 2 | 1 | 1 | .. | .. | .. | .. | .. | 7 | .. |
| Wounds | 3 | 2 | 1 | 2 | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | 2 |
| " gunshot | 292 | 292 | .. | 42 | .. | .. | .. | 1 | .. | .. | 41 | 192 | 40 | 14 | 3 | 1 | .. | .. | .. | .. | .. | 250 | 42 |
| Worms | 3 | 1 | 2 | 1 | 2 | .. | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 |
| Total | 15097 | 8315 | 6782 | 4266 | 3772 | 3661 | 1410 | 1555 | 679 | 233 | 500 | 1928 | 1408 | 1046 | 843 | 777 | 666 | 316 | 68 | 6 | 1 | 7059 | 8038 |

## TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 2. *Mortality classified according to Colour, Nativity, and Wards.*

| DISEASES. | ALMSHOUSE. | PEOPLE OF COLOUR. | COUNTRY. | NATIVITY. United States. | Foreign. | Unknown. | WARDS. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | UNKNOWN WARDS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Abortion | .. | .. | .. | 3 | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. |
| Abscess | 4 | 2 | 3 | 30 | 14 | 8 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 3 | 1 | 2 | 1 | .. | 1 | 1 | 1 | 1 | 1 | 3 | .. | .. | .. | 9 | .. | .. |
| Albuminuria | 2 | .. | .. | 6 | 2 | 2 | .. | 1 | 1 | .. | 2 | .. | .. | 1 | .. | .. | .. | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| Anæmia | .. | .. | 1 | 15 | 4 | 1 | 2 | 2 | .. | .. | 2 | .. | 1 | 1 | 2 | .. | 1 | 2 | .. | .. | 1 | .. | .. | 3 | 1 | .. | .. | .. | 1 | .. | .. | .. |
| Aneurism | 2 | .. | .. | 4 | 7 | 2 | .. | 1 | .. | .. | .. | .. | 2 | .. | .. | 1 | 1 | .. | 1 | .. | 1 | .. | 1 | 1 | 1 | .. | .. | .. | 1 | 2 | .. | .. |
| Anthrax | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Angina pectoris | .. | 1 | 1 | 6 | 5 | .. | 2 | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | 1 | 2 | 2 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Amputation | 1 | .. | .. | 3 | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. |
| Aphthæ | .. | .. | 1 | 4 | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Apoplexy | 10 | 5 | 11 | 80 | 82 | 11 | 11 | 10 | 3 | 4 | 4 | 4 | 7 | 7 | 5 | 6 | 7 | 7 | 1 | 7 | 6 | 6 | 9 | 9 | 8 | 9 | 5 | 3 | 9 | 17 | 1 | .. |
| Asphyxia | .. | .. | .. | 32 | 2 | 1 | 3 | 5 | 1 | 2 | .. | 1 | 2 | .. | 2 | 1 | 1 | .. | 2 | .. | .. | 2 | 2 | 4 | 1 | 3 | 1 | .. | 1 | 1 | .. | .. |
| Asthma | .. | .. | .. | 10 | 14 | .. | 3 | .. | 1 | 3 | .. | 2 | .. | .. | .. | 1 | .. | .. | 1 | 4 | .. | 2 | 3 | 1 | 1 | .. | .. | .. | 1 | 1 | .. | .. |
| Burns and scalds | 3 | 1 | 2 | 62 | 13 | 6 | 11 | 6 | 4 | 5 | 6 | 2 | 5 | 1 | 3 | 3 | 1 | 2 | 2 | .. | 5 | 1 | 1 | 2 | 2 | 4 | 2 | .. | 1 | 7 | 1 | 2 |
| Cancer | 9 | 3 | 1 | 34 | 25 | 11 | 6 | 4 | 1 | .. | 2 | .. | 3 | 1 | 3 | 3 | 5 | 4 | 4 | 5 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 1 | 1 | 10 | .. | .. |
| " of the breast | .. | 1 | .. | 10 | 2 | .. | .. | 1 | 1 | .. | .. | 1 | .. | 1 | .. | 1 | .. | .. | 1 | .. | 1 | .. | .. | 2 | .. | 1 | 1 | 1 | .. | .. | .. | .. |
| " " chest | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " " heart | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " " neck | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. |
| " " ovaries | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " " stomach & bowels | 7 | 3 | 2 | 27 | 32 | 6 | .. | .. | 2 | 3 | 1 | 1 | 8 | 3 | 1 | 1 | .. | 4 | 1 | 4 | 6 | 3 | 8 | 5 | .. | .. | .. | 1 | 3 | 8 | .. | .. |
| " " uterus | 2 | 2 | 1 | 15 | 13 | 2 | 2 | 4 | 1 | .. | .. | .. | 8 | 1 | .. | .. | .. | .. | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 2 | .. | .. | .. | 2 | .. | .. |
| Casualties | .. | 2 | 14 | 67 | 55 | 13 | 14 | 11 | 2 | 12 | 1 | 1 | 8 | 7 | 3 | 3 | 4 | .. | 3 | 5 | 9 | 5 | 2 | 1 | 3 | 4 | 6 | 3 | 4 | 6 | 2 | 2 |
| Croup | 2 | 4 | 9 | 249 | 4 | 5 | 19 | 18 | 10 | 9 | 2 | 7 | 10 | 6 | 4 | 6 | 13 | 6 | 9 | 8 | 13 | 10 | 19 | 14 | 17 | 13 | 9 | 4 | 9 | 9 | 5 | .. |
| Congestion | .. | .. | .. | 3 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " of the brain | 7 | 10 | 10 | 259 | 52 | 13 | 31 | 25 | 15 | 21 | 6 | 10 | 8 | 11 | 4 | 6 | 6 | 10 | 9 | 8 | 17 | 8 | 19 | 10 | 41 | 10 | 5 | 5 | 8 | 13 | 5 | 3 |
| " " bowels | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. |
| " " heart | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| " " liver | 1 | 1 | .. | 2 | 6 | 2 | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | 1 | .. | .. | 3 | 1 | .. | .. | .. | 1 | .. | .. |
| " " lungs | .. | 6 | 6 | 121 | 23 | 3 | 13 | 5 | 2 | 6 | 6 | 7 | 7 | 8 | 3 | 4 | 3 | 6 | 1 | 4 | 7 | 7 | 8 | 6 | 8 | 11 | 1 | 6 | 3 | 5 | 3 | 1 |
| Convulsions | 7 | 36 | 6 | 673 | 18 | 12 | 40 | 48 | 25 | 47 | 21 | 25 | 30 | 13 | 12 | 19 | 21 | 21 | 19 | 25 | 41 | 29 | 38 | 24 | 78 | 37 | 9 | 10 | 20 | 26 | 3 | 13 |
| " puerperal | 2 | .. | 1 | 22 | 21 | 3 | 3 | 2 | 2 | 1 | .. | 1 | 4 | 1 | 2 | 3 | .. | 1 | .. | 1 | 2 | 3 | 2 | .. | 6 | 3 | 3 | .. | 1 | 4 | .. | .. |
| Consumption of bowels | .. | 1 | 1 | 15 | 6 | 2 | 1 | 2 | 1 | 1 | .. | .. | 2 | .. | 1 | 2 | 1 | .. | .. | .. | 1 | 2 | .. | 1 | 2 | 2 | 1 | .. | 1 | 1 | .. | .. |
| " lungs | 121 | 119 | 47 | 1127 | 630 | 192 | 125 | 108 | 55 | 92 | 77 | 41 | 118 | 66 | 45 | 95 | 41 | 46 | 46 | 76 | 117 | 54 | 72 | 69 | 125 | 101 | 27 | 38 | 33 | 198 | 11 | 23 |
| Carbuncle | .. | .. | .. | 4 | 1 | .. | 1 | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Compression of the brain | .. | 2 | 1 | 6 | 4 | 1 | 1 | .. | 1 | .. | .. | .. | 3 | 2 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. |
| Cyanosis | .. | 2 | 1 | 40 | .. | .. | 4 | 3 | 1 | 5 | 2 | .. | 1 | 3 | 1 | 2 | .. | .. | 2 | 2 | 1 | 1 | 1 | .. | 3 | 1 | .. | 2 | 3 | .. | .. | 1 |
| Cirrhosis | 2 | .. | .. | 9 | 4 | 2 | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | 1 | .. | 1 | 2 | .. | 1 | 2 | 1 | 1 | 1 | 1 | .. | .. | .. | 2 | .. | .. |

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 2. *Mortality classified according to Colour, Nativity, and Wards.*

| Diseases. | Almshouse. | People of Colour. | Country. | Nativity. United States. | Foreign. | Unknown. | Wards. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | Unknown Wards. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Concussion of the brain | 1 | 1 | 1 | 5 | 6 | 2 | .. | 1 | 1 | 1 | .. | 1 | .. | .. | 1 | 1 | 2 | 2 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Cholera asphyxia | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " infantum | 2 | 20 | 10 | 623 | 5 | 1 | 64 | 37 | 26 | 22 | 11 | 13 | 41 | 16 | 9 | 17 | 20 | 19 | 14 | 18 | 30 | 25 | 32 | 18 | 54 | 43 | 13 | 13 | 16 | 28 | 12 | 8 |
| " morbus | .. | 3 | 3 | 33 | 21 | 4 | 4 | 7 | 2 | 3 | 2 | .. | 3 | 2 | 1 | 3 | 2 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 5 | 1 | 1 | 1 | 2 | 1 | 1 | .. |
| Cramps | .. | .. | .. | 16 | 1 | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 2 | 1 | 3 | 1 | .. | .. | .. | 3 | 3 | 2 | .. | .. | .. | .. | .. | .. | .. |
| Caries of spine | .. | .. | .. | 4 | 1 | 1 | 1 | .. | 1 | 1 | .. | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " bones of the face | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Chicken-pox | .. | .. | .. | 2 | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Contusion of chest | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Colic | .. | .. | .. | 4 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. |
| Coxalgia | 2 | .. | .. | 3 | 2 | 2 | .. | .. | .. | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | 2 | .. | .. |
| Constipation | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. |
| Coryza | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Coup de soleil | .. | .. | 3 | 4 | 17 | 3 | 3 | .. | 2 | .. | 2 | 2 | 1 | 2 | .. | .. | 2 | .. | .. | 1 | .. | .. | 1 | .. | 3 | 1 | 1 | .. | .. | .. | .. | .. |
| Diphtheria | .. | 6 | 16 | 299 | 13 | 13 | 11 | 16 | 7 | 12 | 13 | 9 | 15 | 11 | 12 | 12 | 6 | 14 | 10 | 19 | 22 | 5 | 9 | 12 | 26 | 15 | .. | 13 | 20 | 12 | 5 | 3 |
| Dropsy | 5 | 21 | 5 | 154 | 73 | 9 | 12 | 14 | 5 | 11 | 7 | 6 | 11 | 7 | 5 | 11 | 13 | 5 | 9 | 14 | 8 | 11 | 14 | 11 | 7 | 13 | 7 | 3 | 6 | 18 | 1 | 2 |
| " abdominal | .. | .. | .. | 10 | 16 | .. | 7 | 1 | 1 | 1 | 1 | 1 | 1 | .. | .. | 1 | 1 | .. | .. | 1 | 1 | .. | 1 | 2 | 2 | .. | .. | .. | 1 | 3 | .. | .. |
| " of the brain | 3 | 9 | 3 | 194 | 3 | 3 | 11 | 11 | 2 | 5 | 4 | 3 | 5 | 5 | .. | 10 | 4 | 7 | 10 | 7 | 17 | 5 | 10 | 11 | 16 | 17 | 6 | 5 | 9 | 13 | 2 | 2 |
| " " chest | .. | 2 | 1 | 42 | 12 | 1 | 1 | 4 | 2 | 2 | 2 | .. | .. | 1 | 1 | 2 | 2 | .. | 3 | 4 | 5 | 2 | 4 | 6 | 5 | 2 | 1 | 1 | 3 | 1 | .. | .. |
| " " heart | 2 | 1 | 5 | 31 | 11 | 3 | 3 | 1 | 4 | 2 | 2 | 2 | 1 | 1 | 1 | 3 | 1 | .. | 1 | 1 | 3 | 1 | .. | 2 | 3 | 1 | 1 | 1 | 1 | 3 | 1 | .. |
| " " ovaries | .. | .. | .. | 4 | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " " stomach | .. | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Disease of the brain | 1 | 3 | 4 | 80 | 15 | 3 | 3 | 3 | 1 | 3 | 4 | 3 | 1 | 5 | 3 | 3 | 4 | 3 | 3 | 5 | 22 | 2 | 2 | 1 | 2 | 10 | 2 | 1 | 1 | 6 | 1 | .. |
| " " bladder | 1 | .. | .. | 2 | 4 | 1 | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| " " chest | .. | .. | 2 | 3 | 2 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| " " heart | 4 | 13 | 48 | 151 | 72 | 19 | 10 | 11 | 8 | 10 | 10 | 6 | 10 | 8 | 3 | 11 | 7 | 4 | 14 | 13 | 19 | 7 | 7 | 4 | 14 | 11 | 6 | 9 | 7 | 11 | .. | 1 |
| " " kidneys | 3 | 3 | 1 | 13 | 14 | 4 | 2 | .. | .. | 3 | 1 | .. | 1 | 3 | 1 | 1 | .. | .. | .. | 2 | 2 | .. | .. | 1 | 4 | 2 | 1 | .. | .. | 6 | .. | .. |
| " " lungs | 1 | 2 | 1 | 13 | 6 | 1 | .. | .. | 1 | 2 | 1 | .. | .. | 2 | 2 | .. | 2 | .. | .. | .. | 4 | .. | 1 | 1 | .. | .. | 1 | .. | .. | 2 | .. | .. |
| " " liver | .. | .. | 2 | 14 | 28 | 1 | 4 | 1 | .. | 1 | 1 | 2 | .. | 1 | 2 | 1 | 3 | 2 | .. | .. | 3 | 2 | 5 | 1 | 3 | 6 | 2 | .. | 1 | .. | .. | .. |
| " " spine | .. | 1 | 2 | 20 | 2 | .. | .. | .. | .. | 2 | 1 | .. | 3 | 1 | .. | 2 | .. | 1 | 1 | .. | 1 | .. | .. | 1 | 2 | 2 | 1 | 1 | .. | 1 | .. | .. |
| " " glands | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " " sto'ch & bowels | .. | .. | .. | 7 | 8 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | 1 | 1 | 2 | .. | .. | 3 | .. | 2 | 1 | .. | .. | .. | .. | 1 | 2 | .. | .. |
| " " skin | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " " throat | .. | .. | .. | 9 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | 1 | 2 | 1 | .. | 1 | .. | .. |
| " " uterus | .. | .. | 1 | 2 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. |
| Diarrhœa | 39 | 12 | 14 | 243 | 65 | 109 | 15 | 21 | 9 | 14 | 9 | 5 | 17 | 5 | 6 | 15 | 8 | 6 | 4 | 2 | 11 | 22 | 14 | 23 | 39 | 15 | 9 | 2 | 10 | 12 | 6 | 1 |
| Debility | 37 | 74 | 11 | 617 | 242 | 81 | 74 | 45 | 35 | 80 | 48 | 21 | 49 | 25 | 19 | 26 | 27 | 21 | 16 | 35 | 41 | 32 | 45 | 51 | 65 | 34 | 18 | 23 | 11 | 64 | 10 | 11 |

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 2. *Mortality classified according to Colour, Nativity, and Wards.*

| DISEASES. | ALMSHOUSE. | PEOPLE OF COLOUR. | COUNTRY. | NATIVITY. | | | WARDS. | | | | | | | | | | | | | | | | | | | | | | | | | UNKNOWN WARDS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | United States. | Foreign. | Unknown. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | |
| Dysentery | 1 | 5 | 6 | 103 | 38 | 22 | 17 | 12 | 2 | 7 | 2 | 3 | 22 | 3 | 2 | 4 | 2 | 5 | 2 | 3 | 7 | 4 | 7 | 7 | 10 | 6 | 3 | 6 | 4 | 14 | .. | 3 |
| Drowned | .. | 6 | 12 | 71 | 36 | 28 | 9 | 6 | 12 | 5 | 12 | 4 | 9 | .. | 2 | 5 | 7 | 1 | 1 | 4 | 2 | 5 | 6 | 5 | 6 | 3 | 3 | .. | 3 | 5 | 5 | 3 |
| Diabetes | .. | 1 | .. | 9 | 1 | .. | 3 | .. | .. | .. | .. | 2 | .. | 1 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. |
| Dyspepsia | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. |
| Dislocation of spine | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Dysuria | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Effusion of the brain | 2 | 3 | 5 | 59 | 3 | 7 | 7 | 4 | 4 | 10 | 2 | .. | 6 | 1 | 4 | 3 | 4 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | .. | 1 | .. | 3 | .. | 1 |
| " " lungs | .. | 1 | .. | 6 | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. |
| Epilepsy | 3 | 1 | 2 | 17 | 7 | 4 | 1 | 1 | .. | 1 | 1 | 2 | 2 | 3 | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | 1 | 3 | 1 | .. | 1 | .. | 6 | 1 | .. |
| Erysipelas | 8 | 3 | 3 | 57 | 9 | 8 | 5 | 5 | 1 | 1 | 2 | 1 | 4 | 4 | 1 | 3 | 2 | 2 | 2 | 2 | 4 | 5 | 1 | 3 | 4 | 5 | .. | 1 | .. | 12 | .. | 1 |
| Emphysema of lungs | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. |
| Enlargement of heart | .. | .. | .. | 3 | 2 | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " liver | .. | .. | .. | 3 | 2 | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. |
| " prostate gland | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Exposure | 1 | .. | .. | 3 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | 2 | .. | .. |
| Empyemia | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Ecthyma | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Fever | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| " bilious | 1 | 1 | .. | 12 | 8 | 3 | 1 | 1 | .. | .. | .. | 1 | 1 | .. | .. | 1 | 2 | .. | 2 | .. | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 3 | .. | .. |
| " brain | .. | .. | 4 | 17 | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | 3 | .. | .. | 4 | .. | 1 | .. | .. | 1 | 1 | 1 | .. |
| " congestive | .. | .. | 1 | 3 | 3 | 2 | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | .. | .. | .. | 1 | .. | .. |
| " camp | .. | .. | .. | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. |
| " catarrh | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " eruptive | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " gastric | .. | .. | .. | 5 | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | 1 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. |
| " hectic | .. | .. | .. | 3 | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. |
| " intermittent | .. | 1 | 1 | 4 | 2 | 1 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. |
| " puerperal | .. | .. | .. | 7 | 16 | .. | 1 | 16 | 2 | .. | .. | .. | .. | 2 | 2 | .. | .. | .. | 1 | 2 | .. | 1 | 2 | .. | 2 | .. | .. | 1 | .. | 1 | .. | .. |
| " rheumatic | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| " malignant | .. | .. | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. |
| " remittent | .. | 1 | 3 | 18 | 3 | 3 | 1 | 1 | 1 | .. | .. | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | 2 | .. | 4 | 2 | 1 | 2 | 1 | 1 | .. | 1 | .. | .. |
| " scarlet | 7 | 7 | 17 | 410 | 3 | 18 | 30 | 30 | 22 | 19 | 11 | 9 | 36 | 19 | 10 | 13 | 7 | 9 | 15 | 23 | 41 | 12 | 17 | 19 | 22 | 20 | 6 | 4 | 2 | 38 | 2 | 2 |
| " typhoid | 3 | 16 | 68 | 392 | 127 | 135 | 34 | 31 | 11 | 17 | 14 | 12 | 45 | 10 | 7 | 48 | 11 | 41 | 18 | 13 | 25 | 25 | 17 | 20 | 51 | 41 | 17 | 8 | 16 | 41 | 8 | 2 |
| " typhus | .. | 1 | 1 | 22 | 15 | .. | .. | 4 | 3 | .. | 2 | .. | 1 | 1 | 1 | 1 | .. | 1 | .. | .. | 3 | .. | 3 | 2 | 8 | 4 | .. | .. | 1 | .. | .. | 1 |
| " yellow | .. | .. | .. | .. | 2 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Fracture of the arm | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. |
| " " leg | .. | 1 | .. | 1 | 7 | .. | 1 | .. | .. | .. | .. | .. | 3 | 1 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 2. *Mortality classified according to Colour, Nativity, and Wards.*

| DISEASES. | ALMSHOUSE. | PEOPLE OF COLOUR. | COUNTRY. | NATIVITY. | | | WARDS. | | | | | | | | | | | | | | | | | | | | | | | | | UNKNOWN WARDS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | United States. | Foreign. | Unknown | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | |
| Fracture of skull | .. | .. | 1 | 4 | 5 | 2 | .. | .. | .. | 1 | 1 | 1 | 1 | .. | .. | 2 | .. | .. | .. | .. | .. | 1 | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. |
| " shoulder | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " thigh | .. | .. | .. | 3 | 1 | 2 | .. | .. | .. | .. | 1 | .. | 1 | 1 | .. | 1 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " pelvis | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Fistula | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Fatty degeneration of heart | .. | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " " kidneys | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| " " liver | 1 | .. | .. | .. | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Gangrene | 5 | 4 | 1 | 36 | 10 | 9 | 3 | 1 | 1 | 2 | 4 | 2 | 1 | 4 | .. | 6 | .. | 1 | 4 | 1 | 2 | 2 | 1 | .. | 3 | 3 | 1 | 4 | 1 | 6 | 1 | .. |
| Gout | 1 | .. | .. | 3 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Gravel | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. |
| Hernia | .. | .. | 1 | 8 | 6 | .. | .. | 2 | 2 | 1 | .. | 1 | 3 | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. |
| Hydrophobia | .. | .. | .. | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. |
| Hooping-cough | .. | 19 | 7 | 201 | 1 | 3 | 4 | 12 | 7 | 10 | 12 | 7 | 16 | 10 | 3 | 8 | 3 | 2 | 7 | 11 | 10 | 2 | 15 | 7 | 15 | 18 | 5 | 7 | 3 | 6 | 1 | .. |
| Hemorrhage | 1 | 1 | 2 | 50 | 27 | 5 | 9 | 4 | 2 | 3 | 1 | .. | 5 | 3 | 2 | 4 | 2 | 1 | 4 | 2 | 11 | 3 | 10 | 1 | 5 | 2 | 1 | 1 | 1 | 3 | .. | .. |
| " of lungs | .. | 1 | 1 | 16 | 5 | .. | 3 | .. | 1 | .. | 1 | .. | 2 | .. | 2 | .. | .. | .. | 1 | 3 | 3 | .. | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| " kidneys | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " stomach & bowels | .. | .. | 1 | 6 | 2 | .. | .. | 1 | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | 1 | .. | .. |
| " uterus | .. | .. | 1 | 7 | 6 | .. | 1 | .. | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | 1 | 1 | .. | 3 | 1 | .. | .. | .. | .. | .. |
| Inflammation | 1 | .. | .. | 4 | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | 1 | .. | .. |
| " brain | 9 | 15 | 7 | 331 | 16 | 15 | 31 | 26 | 17 | 20 | 11 | 8 | 19 | 11 | 11 | 8 | 13 | 9 | 6 | 7 | 26 | 16 | 20 | 12 | 21 | 12 | 4 | 11 | 9 | 20 | 2 | 5 |
| " bronchi | 3 | 12 | 1 | 89 | 21 | 6 | 8 | 4 | 3 | 5 | 5 | 6 | 9 | 9 | 6 | 2 | 4 | 3 | 3 | 6 | 6 | 5 | 7 | 2 | 3 | 5 | 4 | 4 | 1 | 5 | .. | .. |
| " breast | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| " bladder | 1 | 2 | 1 | 5 | 9 | 1 | .. | 1 | 1 | 2 | 1 | .. | 2 | .. | .. | 1 | 1 | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 3 | .. | .. |
| " chest | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " ear | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " heart | 1 | .. | .. | 17 | 9 | 2 | 1 | 1 | 3 | 2 | .. | .. | 1 | 1 | 1 | .. | 1 | 3 | 1 | .. | 3 | 1 | 2 | .. | 1 | 2 | .. | 1 | .. | 2 | .. | 1 |
| " kidneys | 1 | .. | .. | 1 | 3 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 3 | .. | .. |
| " lungs | 26 | 49 | 19 | 538 | 113 | 48 | 62 | 41 | 27 | 30 | 36 | 16 | 49 | 30 | 19 | 36 | 10 | 15 | 13 | 12 | 36 | 28 | 25 | 38 | 49 | 28 | 21 | 21 | 14 | 62 | 7 | 2 |
| " liver | 1 | 1 | 1 | 19 | 17 | 2 | 3 | 2 | 1 | .. | .. | 1 | 3 | 3 | 1 | 1 | 2 | .. | .. | 3 | 1 | 3 | .. | 2 | 3 | 1 | 1 | 1 | 2 | 2 | .. | 1 |
| " larynx | 3 | .. | .. | 16 | 3 | 3 | .. | 2 | .. | 1 | .. | 1 | .. | 2 | .. | .. | 1 | 1 | 4 | 1 | 2 | .. | .. | .. | .. | 2 | .. | .. | 1 | 4 | .. | .. |
| " peritoneum | 6 | 4 | .. | 40 | 36 | 11 | 11 | 1 | 4 | 4 | 4 | 2 | 5 | 3 | 5 | 10 | 1 | 1 | 5 | 2 | 5 | 1 | 3 | 3 | 4 | 5 | .. | 1 | .. | 7 | .. | .. |
| " prostate gland | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " pleura | 3 | 1 | .. | 13 | 5 | 2 | 1 | 2 | .. | .. | .. | .. | 3 | .. | .. | 4 | 1 | .. | .. | 1 | 1 | .. | 1 | .. | 1 | 1 | 1 | .. | .. | 3 | .. | .. |
| " parotid glands | .. | 1 | .. | 4 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| " pharynx | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " stomach & bowels | 7 | 14 | 11 | 219 | 69 | 18 | 24 | 10 | 9 | 17 | 13 | 6 | 22 | 6 | 6 | 10 | 8 | 6 | 7 | 7 | 12 | 13 | 17 | 18 | 23 | 18 | 8 | 5 | 7 | 19 | 1 | 3 |

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Continued.

Division 2. *Mortality classified according to Colour, Nativity, and Wards.*

| DISEASES. | Almshouse. | People of colour. | Country. | Nativity. United States. | Nativity. Foreign. | Nativity. Unknown. | Wards. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | Unknown Wards. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inflammation of spine | .. | .. | .. | 6 | 1 | .. | 1 | .. | 1 | 1 | .. | .. | .. | 1 | .. | 1 | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " spleen | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " throat | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " tonsils | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " uterus | .. | .. | .. | 2 | 5 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| " veins | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Inanition | 10 | 5 | 5 | 93 | 10 | 22 | 10 | 11 | 4 | 5 | 1 | 1 | 4 | 4 | 1 | 12 | 2 | 1 | 5 | 8 | 2 | 3 | 4 | .. | 13 | 3 | .. | 3 | 1 | 21 | 1 | .. |
| Insanity | .. | .. | 1 | 6 | 1 | 1 | .. | .. | .. | .. | .. | .. | 1 | 2 | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | 1 | .. | .. |
| Jaundice | .. | .. | .. | 18 | 8 | 1 | 4 | .. | 1 | 1 | .. | .. | 2 | .. | 1 | 1 | .. | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | .. | .. |
| Intemperance and exposure | 1 | 10 | 1 | 4 | 11 | 67 | 4 | 1 | 13 | 17 | 8 | 4 | 1 | 1 | 1 | 2 | 1 | .. | .. | 1 | 1 | 1 | 4 | .. | 3 | 1 | .. | .. | 1 | 9 | 1 | 6 |
| Icterus | .. | .. | .. | 5 | 1 | .. | 1 | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. |
| Leucocythemia | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Marasmus | 34 | 29 | 4 | 592 | 28 | 23 | 41 | 31 | 17 | 30 | 21 | 12 | 37 | 20 | 21 | 9 | 11 | 15 | 11 | 11 | 32 | 32 | 51 | 49 | 62 | 27 | 15 | 15 | 14 | 52 | 2 | 1 |
| Measles | 1 | 2 | 2 | 104 | 1 | 4 | 8 | 7 | 6 | 7 | 2 | 4 | 6 | 4 | 2 | 2 | 8 | 2 | 3 | 2 | 7 | 5 | 3 | 1 | 9 | 4 | .. | 1 | 9 | 5 | .. | .. |
| Mania à potu | 6 | .. | 1 | 19 | 27 | 11 | 8 | 1 | 1 | .. | 4 | 1 | 5 | 2 | .. | 1 | 2 | 2 | 1 | 5 | 3 | 2 | 2 | 1 | 2 | 3 | .. | .. | .. | 8 | .. | 2 |
| Malformation | .. | 1 | 1 | 20 | .. | .. | 1 | .. | .. | 3 | 2 | 1 | .. | .. | .. | 1 | .. | .. | 1 | 1 | .. | .. | .. | 1 | 2 | 1 | .. | .. | 2 | 2 | .. | 1 |
| Metastasis | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. |
| Melanosis | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. |
| Neuralgia | .. | 1 | .. | 9 | .. | 1 | 2 | 1 | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. |
| Neglect | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Neurosis | .. | .. | .. | 4 | 1 | .. | .. | .. | .. | 1 | .. | .. | 1 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. |
| Necrosis | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. |
| Old age | 5 | 9 | 6 | 112 | 99 | 8 | 12 | 13 | 6 | 6 | 11 | 5 | 6 | 8 | 8 | 21 | 4 | 6 | 8 | 13 | 11 | 7 | 6 | 12 | 10 | 18 | 2 | 1 | 4 | 14 | 1 | .. |
| Obstruction of the bowels | 1 | .. | .. | 19 | 5 | .. | 1 | 1 | .. | .. | .. | .. | 1 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | .. | 2 | .. | .. | 1 | .. | 1 | 1 | 1 |
| Overdose of ether | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Ossification of the heart | 1 | .. | .. | 3 | 4 | 1 | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | .. | 2 | .. | .. |
| " " aorta | .. | .. | .. | 3 | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. |
| Œdema of the glottis | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Palsy | 5 | 3 | 8 | 106 | 45 | 13 | 11 | 9 | 5 | 6 | 9 | 4 | 7 | 3 | 9 | 7 | 7 | 3 | 7 | 7 | 9 | 6 | 2 | 4 | 5 | 8 | 2 | 7 | 3 | 11 | 4 | 1 |
| Pyæmia | 5 | .. | .. | 11 | 7 | 11 | 1 | 1 | 1 | 1 | .. | .. | 3 | .. | 1 | 2 | .. | 1 | .. | 1 | .. | 1 | .. | 1 | 1 | 1 | .. | 1 | 1 | 11 | .. | .. |
| Purpura | .. | .. | .. | 4 | 2 | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Poisoning | .. | .. | .. | 5 | 1 | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Rupia | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Rheumatism | .. | .. | 1 | 8 | 10 | 2 | .. | 1 | 1 | .. | .. | .. | 2 | .. | .. | 2 | 1 | 2 | .. | 1 | 2 | .. | 2 | 1 | 1 | 1 | 1 | .. | 1 | .. | .. | .. |
| Rupture | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| " of the uterus | .. | .. | .. | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | 1 |
| " " aorta | 1 | 1 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |

TABLE VI.—*Interments in the City of Philadelphia during* 1862—Concluded.

Division 2. *Mortality classified according to Colour, Nativity, and Wards.*

| DISEASES. | Almshouse. | People of colour. | Country. | Nativity. United States. | Foreign. | Unknown | Wards. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | Unknown Wards. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Scrofula | 12 | 9 | 1 | 57 | 6 | 11 | 4 | 7 | 2 | 4 | 3 | 1 | 3 | 3 | .. | 2 | .. | 2 | 1 | 1 | 2 | 1 | 2 | 4 | 4 | 7 | 1 | 1 | 3 | 15 | .. | .. |
| Smallpox | .. | 4 | 1 | 236 | 17 | 11 | 39 | 25 | 12 | 11 | 6 | 2 | 9 | 4 | 6 | 3 | 12 | 5 | 3 | 5 | 10 | 12 | 13 | 6 | 21 | 13 | 15 | 12 | 1 | 7 | 4 | 4 |
| Softening of the brain | 2 | .. | 2 | 29 | 7 | 7 | 3 | 3 | 1 | 5 | 3 | .. | 4 | 1 | 2 | 4 | .. | .. | 1 | 1 | 1 | 1 | 1 | .. | 2 | 1 | .. | 1 | 3 | 3 | .. | .. |
| " " heart | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Stillborn | .. | 54 | 4 | 709 | ... | 2 | 56 | 10 | 25 | 41 | 31 | 28 | 31 | 17 | 17 | 21 | 19 | 25 | 16 | 22 | 51 | 26 | 47 | 30 | 52 | 34 | 11 | 7 | 12 | 21 | 5 | 16 |
| Syphilis | 13 | 2 | .. | 14 | .. | 7 | 1 | .. | .. | 1 | 2 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | 11 | .. | .. |
| Suicide | .. | .. | .. | 6 | 6 | 2 | 1 | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | 3 | 1 | 1 | 1 | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 3 | .. | .. |
| Suffocation | .. | 2 | .. | 9 | 3 | 1 | 1 | .. | .. | 1 | 1 | .. | 2 | .. | .. | .. | 1 | 1 | .. | .. | 2 | .. | .. | .. | .. | 2 | .. | 1 | .. | 1 | .. | .. |
| Stricture of œsophagus | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " pyloris | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| " glottis | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Strangulation | .. | .. | .. | 3 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. |
| Suffocating catarrh | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Syncope | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Scurvy | .. | .. | .. | 2 | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | .. | .. | .. | .. | .. | .. | .. |
| Tumours | 1 | 2 | 2 | 11 | 8 | 2 | 1 | 1 | .. | .. | .. | .. | .. | 2 | .. | 1 | 2 | .. | 1 | .. | 4 | .. | 1 | 1 | 2 | .. | .. | .. | .. | 2 | 1 | .. |
| Tympanitis | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Tetanus | 1 | 2 | 1 | 21 | 4 | 2 | 3 | 2 | 1 | 2 | .. | .. | 3 | 1 | .. | 1 | .. | 1 | 1 | 1 | .. | .. | 2 | .. | 3 | 2 | 2 | .. | .. | 1 | .. | .. |
| Teething | .. | 1 | 1 | 41 | .. | .. | 2 | 4 | .. | 2 | .. | 1 | 4 | 2 | .. | .. | 2 | 1 | 2 | .. | 2 | 2 | 2 | 3 | 8 | 2 | 1 | .. | .. | .. | .. | .. |
| Unknown | 15 | 3 | 20 | 41 | 11 | 42 | 5 | .. | .. | 1 | 5 | 2 | 3 | 2 | 2 | 2 | 1 | 1 | .. | 2 | 1 | 3 | 6 | 2 | 3 | 4 | .. | .. | .. | 31 | .. | 1 |
| Ulceration | 4 | 1 | .. | 2 | .. | 4 | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. |
| " of the bowels | 4 | .. | 1 | 8 | 7 | 6 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 3 | .. | .. | 2 | 3 | .. | 1 | .. | 1 | 7 | .. | .. |
| " " bladder | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| " " larynx | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| " " stomach | 2 | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| " " throat | .. | .. | .. | 3 | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Violence | .. | .. | .. | 2 | 4 | 1 | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. |
| Wounds | .. | 1 | .. | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| " gunshot | .. | .. | 51 | 162 | 60 | 70 | 12 | 7 | 0 | 3 | 5 | 8 | 15 | 3 | 8 | 21 | 4 | 36 | 8 | 12 | 14 | 17 | 6 | 4 | 6 | 19 | 6 | 1 | 3 | 6 | 2 | 3 |
| Worms | .. | 1 | .. | 3 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Total | 508 | 721 | 522 | 11059 | 2762 | 1276 | 1037 | 827 | 491 | 711 | 520 | 350 | 829 | 465 | 338 | 590 | 381 | 429 | 380 | 493 | 819 | 520 | 677 | 596 | 1042 | 736 | 284 | 286 | 329 | 1168 | 130 | 135 |

| | | |
|---|---|---|
| Total number of deaths reported for 1862 | | 15,097 |
| White | 14,376 | |
| Coloured | 721 | |
| Total | | 15,097 |
| Males | 8,315 | |
| Females | 6,782 | |
| Total | | 15,097 |
| From which deduct stillborn | | 711 |

| | | |
|---|---|---|
| The number of male adults | 4,019 | |
| " " female adults | 3,010 | |
| " " male children | 4,266 | |
| " " female children | 3,772 | |
| | | 15,097 |
| Deduct stillborn males | 414 | |
| " " females | 297 | |
| | | 711 |
| | | 14,386 |

**In Twenty-fourth Ward deduct deaths in Philadelphia Almshouse, 508.**

*April* 1. *Spotted Fever, occurring in the vicinity of Philadelphia in the year* 1863. *Symptoms, Pathology, and Diagnosis.* Dr. W. W. GERHARD read the following account of this fever:—

About the middle of last February I was called to a case of a new form of disease; the patient, a boy of sixteen years of age, was taken suddenly with intense pain in head and back, with occasional delirium; there was also vomiting and nausea. In the intervals of the delirium he was dull and heavy, but able to answer questions correctly.

On the second day there was an eruption over the whole body of spots varying in size from such as would be caused by the prick of a pin, to an inch or more in breadth. These spots were of a dull red colour, not in the slightest degree elevated, and rather resembling ecchymoses, such as might be caused by the puncture of an insect than a proper eruption. There was no diarrhœa; moderate heat and fever; the tongue was scarcely coated. This patient died in four days from the attack, sinking into a state of coma. A sister of this patient, aged twenty, was taken ill and died in twenty-six hours from the commencement. She was attended by Dr. Packard, and had an eruption similar in all respects to that of the other patient during life. On examination after death no distinctive lesion was found.

A few days after these occurrences I was called to the Falls of Schuylkill, five miles out of the city, to see a number of cases of a new form of disease, which had excited much alarm in the neighbourhood; these were under the care of Drs. Service, Uhler, and Wilson. It was in that locality exceedingly fatal; in one family there were three deaths, and one other bad case of the disease, besides several others who were suffering from the causes of it in a mild form.

In another family there were also three fatal attacks; in a third there were two cases, one of which was fatal. The other cases which occurred, to the number of about twenty, were scattered singly in different families and in various localities. The isolated cases were less fatal than those which occurred in groups. Of the whole number of twenty, ten terminated fatally.

Unfortunately, no examination after death was permitted in any of these cases, notwithstanding the most urgent entreaties.

From an examination of the symptoms of a number of these cases, and comparing them with the one I had already seen in Philadelphia, I was enabled to make out the characters of this affection, which, never having been met with before in Philadelphia, was entirely novel to all of our physicians. The disease is unknown in Europe, and is not even mentioned in the complete work of Dr. Wood, or in any other one, I believe, on the Practice of Medicine. The only account of it to be found is an imperfect description given of it by a number of physicians in New England, where the disease appeared more than half a century ago, from the year 1807 to 1815 or 1816. These are contained in the works of Dr. Gallup, of Vermont, published in the year 1815, who speaks of it as having occurred for the first time in Massachusetts in 1806. Dr. E. Hale, of Boston, has also given an account of this disease, but there is a legitimate ground for doubt whether the disease he describes is not in fact genuine typhus fever, and totally different from true spotted fever. This work was published at Boston, in 1818, and there are scattered papers on the subject to be found in the *New England Journal* in the year 1814 and '15. Dr. Gallup gave the name of spotted fever to it. This designation should be retained, inasmuch as it is drawn from one of the most characteristic symptoms of a disorder which offers no peculiar anatomical lesions.

It seems also that epidemics of the same disease have appeared in Europe within different periods; such, at least, is the opinion of Dr. Gallup, although the history of the disease left to us is exceedingly imperfect.

There is no doubt that spotted fever has existed for some time in localities occupied by the U. S. troops. After the epidemic had occurred in the neighbourhood of Philadelphia I inquired of several of the army surgeons if they had seen any cases of the kind. They informed me that a number of examples of this unknown disorder had occurred near Norfolk, Virginia; and I have also heard that it has shown itself at Washington and Annapolis. Two cases, evidently of the spotted fever, are reported by Dr. Crary, of Hartford, in May, 1862, to the Connecticut Medical Society. The author speaks of them as examples of an anomalous and fatal variety of disease. (*Amer. Journal*, Jan. 1863.) I am also inclined to believe that the epidemic which occurred a short time since at Newport among the pupils of the Naval School was spotted fever, but I have yet seen no detailed account of it.

A limited but very fatal epidemic of this disease occurred during the month of March in Centre County, and another has also shown itself in York County, in this State. In the vicinity of Philadelphia the towns most affected by it were Manayunk, the Falls of Schuylkill, Norristown, Frankford, and Chester. It was not confined to the villages themselves, but has also shown itself in isolated dwellings. In the city of Philadelphia itself there were a number of cases, but scattered over a wide extent. From all the data I can collect, I should set down the number of cases in the months of March and April as at least two hundred. These occurred principally in the neighbouring towns, with but very few in the city proper.

*Mode of attack and symptoms.*—Some patients are taken down suddenly without the slightest premonition, with a chill and intense headache; others, again, have the usual premonitory symptoms of acute diseases for a few hours; a chill will then supervene, followed by fever; the countenance is slightly flushed, and the patient becomes dull and heavy—so much so that after a few hours, in bad cases, it is impossible to obtain any pertinent answer from a patient. In other cases he is dull and stupid, but answers when loudly spoken to. In slight cases there is merely a little dulness, but no positive stupor. There is occasionally positive delirium, but as a general rule the disturbance of the mind inclines more towards stupor or coma than active delirium. In fatal cases the patient always dies in a state of coma, which lasts several hours before death.

Another symptom of the disease is intense pain in the head and back, extending often to the limbs. This occurs with a chill, but very soon subsides, or at least is not spoken of by the patient, except when questions are directed to the subject. There is often vomiting at the commencement, but not usually very frequent or often repeated, and no epigastric tenderness. The bowels are rather constipated; there is a disgust for food in proportion to the severity of the fever. The urine is perfectly healthy.

The degree of fever is various; the pulse is frequent, not very strong, and in bad cases its force and frequency often diminish; the respiratory organs are perfectly healthy. The heat of the skin is more moderate than in most attacks of acute disease. In some cases I have remarked a peculiar odour exhaling from the patient. This, however, is not so marked as in many other varieties of disease.

*Eruption.*—In every case of the disease which I have seen, with the exception of one or two, terminating after an attack of a few hours, there occurred a characteristic eruption. This consisted of small spots, varying

in size from the point of a pin to the breadth of a quarter of an inch. In some patients there were much larger spots, or ecchymoses an inch or two in breadth; these seemed to depend upon the same causes which produced the smaller ones, and to be in fact identical with them, so that they might be termed confluent. The eruption, which at first glance resembled a genuine exanthema, was, on careful inspection, found to be very different from it. Each spot was of a dull red colour, almost purple in some cases, varying in shade, and, for the most part, not at all affected by pressure; some of the lighter coloured spots were to a certain degree diminished when strongly compressed, but the darker ones were evidently due to an effusion of blood in the midst of the true skin, and were therefore not modified in any way by external pressure. The spots were not in the slightest degree elevated above the surface, and were scattered pretty equally throughout the body, perhaps a little more abundant in the extremities than the trunk. The spots appeared usually at the end of twenty-four hours, but sometimes even sooner, and in some cases were visible after death, although not very perceptible during life. This was the case in those instances which terminated soon after the commencement of the attack. It may be readily believed from these remarks that the eruption was a simple exudation of blood or ecchymosis taking place beneath the skin, and similar in many respects to the spots which were sometimes visible in the interior of the body. In the cases of many patients the duration of the spots was very various—they were visible at least for a week or two, disappearing very slowly, in the same way as the dark colour of a bruise.

The complexion in many cases was peculiar, of a dull slightly sallow hue, but no trace of regular jaundice was perceived, nor did the countenance present the intensely red colour so often observed in typhus and typhoid fever. The eye was moderately injected in some cases, but rather in the veins than the arteries, and of a dull red hue. The injection, however, did not seem to be invariably present. No trace existed of any glandular swelling or inflammation, except in one case, in which an eye rapidly passed into suppuration and was entirely destroyed.

*Age and sex.*—No age was exempted; the patients were from two years to eighty-two. The largest proportion of cases, however, were in the young, between the ages of fifteen and twenty-five. More females than males were attacked. Of the cases which I saw two-thirds at least were females. Still, I would not conclude that one sex is necessarily more disposed to it than the other.

*Anatomical lesions.*—In one case in Manayunk, a patient of Dr. Uhler, I was enabled to see the autopsy of the whole body. The brain was found to be congested with blood, the veins containing an unusual quantity of it. At the base of the brain was an effusion of a few ounces of serum; the ventricles of the brain contained a moderate quantity of serum, but there was not a trace of any lesion produced by inflammation.

The lungs were slightly congested at their posterior portion, but in other respects were healthy and crepitant. The right cavities of the heart contained a considerable quantity of black fluid blood, of a remarkably dark hue, with a very small and flaccid coagulum. The left ventricle was perfectly empty. On the portion of the pericardium covering the left ventricle were two spots of a deep red colour, one of a quarter of an inch in breadth, the other somewhat larger, dependent upon an effusion of blood beneath the membrane. Another spot, of a rather larger size, was found beneath the serous membrane of the stomach. All these sub-serous ecchy-

moses were precisely similar to that found in one of the glands of Peyer, and were evidently dependent upon similar blood effusions.

The stomach contained but little mucus, its internal coat firm and healthy, and moderately injected. The small intestines healthy throughout, except one of the glands of Peyer, in which there was an ecchymosis of blood a quarter of an inch in breadth; the large intestine was healthy. The liver was of its natural colour and healthy.

The uterus was healthy, with a small coagulum of blood attached to its orifice. Beneath the serous membrane of the stomach was a dark red spot, of a third of an inch in breadth, similar to those already mentioned, and evidently depending upon a local effusion of blood.

The anatomical lesions thus confirmed the conclusions at which I had already arrived, respecting the pathology of the disease. That is, it is strictly a blood disorder, unconnected with any structural lesion. The internal ecchymoses of blood are precisely similar to the spots on the skin, and are evidently depending on the same cause. This fact establishes a wide distinction between them and those appearing in typhus and typhoid fevers, as well as the eruptions of the exanthemata. Although the proof of spotted fever being a blood disease is to my mind conclusive, it must not be ascribed to an impoverished condition of this fluid from innutritious or deficient food, as none of the patients whom I saw was in a condition of actual poverty, and a large majority of them belonged to a class amply supplied with all the comforts of life.

*Origin and extension of the disease.*—It is very evident from all the facts which I have learned, that this disorder appeared in the Army in Virginia before it had reached Pennsylvania; and it has evidently shown itself in other places, as in Connecticut. In this State it has struck particular localities, not, however, rigidly confined to them, but extending to detached habitations, and attacking persons who had not been in the neighbourhood of any sick. In the city of Philadelphia it has not extended beyond the families of those first attacked; nor, with the exception of a single instance, have I known more than one person in a family affected by it. At the Falls of the Schuylkill it presented some tendency to prevail in families. In one there were, including all cases, both grave and slight, at least seven or eight affected. Still the disease did not necessarily extend itself to the neighbours, who were constantly engaged watching the sick, nor was the reception of one patient into a house at all a cause of attack of disease to others. At Manayunk it broke out amongst the workwomen employed in one room in a woollen-mill, which furnished a number of patients, giving rise to the idea among the people of Manayunk that the disease was propagated from some contagious matter contained in the wool. It is needless to say this opinion was totally unfounded; indeed, from the whole history of the disease, there is no reason to conclude that it is in any way contagious, or, if at all capable of transmission one to another, it must be only in peculiar cases, like typhoid fever or dysentery, which, although as a general rule not contagious, are in some cases capable of transmission to other patients. I am inclined to believe that there is no positive evidence of this disease being ever communicated from an infected patient to those who are healthy. It is the more important to understand this mode of propagation of the disease, as some individuals have been disposed to regard it as a contagious disorder originating from the army.

*Duration.*—No disease has, in the fatal cases, a much more rapid course. A case terminated fatally in seven or eight hours; a number have died in

from twelve to twenty-four hours. The largest number in the course of the second day. If the patient should live after forty-eight or fifty hours there is a fair chance of recovery, although fatal cases are met with after lasting for several days. In one case, even, death followed after the lapse of several weeks. The duration of cases ending in recovery is equally variable with those that are mortal. Some are convalescent after two or three days of indisposition, others last for a week or two, and in one case at the Falls of Schuylkill, a patient of Dr. Service, recovery was protracted for many weeks.

*Diagnosis.*—It must be very plain that on the first appearance of an unknown disease in our midst, all ordinary rules of diagnosis fail. The first case which I saw, was so utterly perplexing, that I could not in my mind arrive at any satisfactory diagnosis of the case, therefore as the symptoms of the brain were more developed than those of any other organ, I reported the case as death from meningitis. A physician who attended another case in the same family was equally puzzled with myself, and reported the disease as typhoid fever. There are two cases evidently of this disease reported by Dr. Crary in the *American Journal*, January, 1863, as examples of an unknown and fatal character. The diagnosis of the affection, when once thoroughly understood, is not, however, difficult, for the same set of symptoms occur in no other disease. These are the sudden occurrence of intense headache and spinal pain, followed by the peculiar eruption which resembles that of no other fever, but presents a distinct resemblance to the ecchymosis of scurvy, and besides this, the rapid development of brain symptoms, that is stupor, more or less severe, and in bad cases always coma. No one who has become once familiar with this disease can possibly mistake it for any other, such as typhoid or typhus fever, or the various forms of exanthema.

A number of my medical friends, of the highest professional standing in this city, have never yet seen examples of spotted fever. Under these circumstances some of them have been led into precisely the same error of diagnosis into which I had myself fallen with regard to my first case of this disease. Some have fancied it was a variety of typhoid fever; a larger number, of typhus fever; and one, oddly enough, of influenza. It requires nothing but actual observation to entirely dissipate all such ideas. The disease belongs to the same class as other continued fevers or exanthemata, but is just as distinct from typhoid or typhus fevers as from measles or smallpox. The two affections to which it has the closest similarity are the petechial typhus fever and some malignant varieties of scarlatina.

The peculiar colour and form of the eruption, and the development of throat symptoms in the latter affection, added to the other characters of the disease, will point out sufficiently the pathognomonic symptoms of scarlet fever. There remains, then, merely the diagnosis between spotted fever and certain varieties of typhus; for I take it as demonstrated that no one could possibly confound two diseases so perfectly distinct as spotted and typhoid fever.

Between typhus and spotted fever, however, there are some points of resemblance; both these diseases attack subjects of any age, are nearly equally free from pathological lesions, and are each attended by a peculiar eruption. Still there are well marked diagnostic characters which mark a broad distinction between these diseases. These are as follows: in spotted fever the disease is very rapid in its course, with delirium, but rarely of an active kind; an eruption wholly different from that of typhus; less heat of

skin, which is never of the burning temperature of typhus, and with none of the peculiar odour of this disease. Typhus offers a true exanthematic eruption; but I have already described that of spotted fever to be rather a scorbutic hemorrhage than a real exanthema. Besides, the duration of typhus fever is nearly as regular and as long as typhoid; whereas in spotted fever the course of the disease is irregular, and generally much shorter. The fearful difference in the mortality of the two disorders and the unequivocally contagious character of typhus fever, with the slight probability of the existence of any symptom of the same kind in spotted fever, are also additional points of diagnosis.

In the year 1836 I was first led to study the diagnostic characters of typhus and to lay down the distinctive characters separating it from typhoid fevers. (*Amer. Journal*, 1837.) These are now adopted by all the physicians of the French school, and by a large number of English observers. I could not, therefore, help regarding it a most fortunate circumstance that accident had afforded me an occasion for establishing the characters of another variety of febrile disorder which, although not so common as either typhus or typhoid fever, is yet more fatal in its symptoms and course. These three varieties of fever I regard as more distinct than many cases of intermittent and remittent; and although occasionally the distinctive characters may be somewhat confused one with another, yet on the whole they are so well defined that no legitimate excuse can exist for confounding them one with another. The diagnosis of the spotted fever is, however, much better defined than that of typhus and typhoid is in all cases, for sometimes these approach so nearly in their symptoms as to render the diagnosis of them very difficult. In spotted fever no one with but a moderate power of observation could possibly confound it with the other affections; although some medical gentlemen of high professional standing have supposed it to be identical with them. The only thing which makes their opinion valueless is that they have never seen a case of spotted fever.

This disease, indeed, is one which I should place in the list of rare peculiar disorders, evidently depending upon a diseased condition of the blood, which occasionally show themselves; they last for a time, then disappear, but are not sufficiently permanent in their attacks to find a place in the regular treatises on the practice of medicine. Such were the two epidemics of negro fever, as they were called, which appeared in Philadelphia, the last one about fifteen years ago. Of the second of these epidemics, I am sorry to say, no history was ever given. A short account of the first one which appeared in the years 1820–21, at Philadelphia, was given by Dr. Emerson in the 3d volume of the *Philadelphia Medical Journal*. It is very evident that although this was, like spotted fever, a blood disease, in symptoms and course it was very different. It was besides almost confined to the coloured inhabitants of the city. Of the last mentioned one, I saw a few cases at the Almshouse in this city; it did not, however, bear the slightest resemblance to the spotted fever, and besides, was confined mainly to the colored population. It is needless to say some history should be preserved of all such rare and anomalous forms of epidemic disease.

Besides, the diagnosis becomes easy to one who has become familiar with the disease, from the individual physiognomy of the patient. There is a peculiar dusky hue, and an expression of stupor conjoined with the eruption which characterize the disease at once, especially if we add to these signs the cerebral symptoms of the disease. The diagnosis of the

disorder has been especially interesting to me, as I believe that I was earliest in making out its distinctive characters; certainly so in this locality.

*Prognosis.*—The prognosis of the disease is soon learned. If the cerebro-spinal symptoms are but moderate, and the fever not very intense, the patient will certainly recover unless badly treated. The prognosis is always, however, a most serious one. At its first appearance as an epidemic it is exceedingly fatal. In different localities from one-half to two-thirds of those attacked have fallen victims; in one locality I have been told the mortality was even greater, nearly all attacked having died. When a proper system of treatment is adopted, a favourable prognosis may often be made. If, however, the poisonous cause of the disease acts with great energy, rendering the patient comatose within a few hours, the prognosis is very serious if not necessarily fatal.

*Mortality.*—The mortality in spotted fever like that in many other severe diseases, is of course at first very great, as in all epidemics of the kind. Physicians endowed with a moderate degree of self-complacency are apt to imagine that they have adopted a new and successful method of treating a disease, when, in reality, the sole difference is, that the disorder has lost the violent character which at first was peculiar to it; still, this epidemic of spotted fever has been thus far so severe that it is probable, though I cannot state the proportion with certainty, that at least one case out of three or four has been fatal. At first the mortality was much greater in several localities.

*Nomenclature.*—Inasmuch as this disease is attended by no definite anatomical lesions, the appellation given to it more than half a century ago by Dr. Gallup and others in New England of spotted fever, should be retained. It is sufficiently characteristic, and involves no doubtful point in question. The only objection to the term is that the disease may be confounded with epidemic typhus or ship fever, in which the whole body is also covered with spots, but these constitute a real exanthema, and are, of course, of a totally different character and aspect from the eruption of spotted fever. The latter is little else than a real hemorrhagic effusion very like that of scurvy.

*Treatment.*—In the present epidemic I have never practised nor advised bloodletting in any case I have seen; nor am I aware that others have resorted to it; the whole characters of the disease are such as would render this remedy, in the majority of cases, exceedingly dangerous. I should very much doubt, from the pathological history of the disease, whether general bleeding would ever be appropriate, as the disease is one evidently depending upon a morbid but not inflammatory condition of the blood. Cupping has been tried in a number of cases, but with doubtful results. In some cases, however, it is possible it may be a benefit. The principal treatment consists in applying external heat in the cold stage, and afterwards placing flying sinapisms to the extremities. A blister to the back of the neck may sometimes be applied; but of the favourable action of this remedy I must admit that there is often much doubt. Not that the immediate contra-stimulant action might not relieve the brain and produce a salutary revulsion upon the nerves immediately connected, but because the disease is so evidently a blood disorder, with a strong tendency to local effusion. Therefore, if we carelessly direct the application of blisters we may do mischief to a patient in whom extravasation of blood has either actually taken place, or is in imminence of showing itself. The head should be

sponged with cold water, and occasionally cold may be more permanently applied.

The most important remedies, however, are stimulants—whisky, brandy, and the like, and quinine given in doses of a grain every hour. Sometimes as much as two grains every hour may be administered for a short time. The quantity of brandy used is sometimes very large—at least a tablespoonful every two hours, or even every hour. In others a much less dose will be ample; that is, the same rule should be observed in the treatment of this disease as in many cases of typhus fever; stimulants should be given in such quantities as the peculiar symptoms of the individual case and the special condition of the patient may require. It is, of course, impossible to fix any precise quantity as the dose which is required; but a certain proportion of wine or some alcoholic stimulant has been necessary in every case which I have seen. Other stimulants are doubtless often of service, such as ammonia, ginger, &c., but as none of them is equal to some alcoholic preparation, they are of comparatively little value in so rapid a disease as spotted fever.

The necessity for stimulation is based upon the rapid loss of force which takes place in this disease. To so great a degree does this exist that I have not seen good effects from even local abstraction of blood which was prescribed in a few cases by physicians who had been in attendance on several of the patients. This view of the effect of bloodletting is confirmed also by the pathology of the disease. It is not an inflammatory disorder, but obviously depends on an altered condition of the blood, which cannot be cured by diminishing its quantity, but on the contrary the true treatment of the affection depends upon the curative efforts of the system, which is to be supported instead of enfeebled during the process.

Singularly enough, however, Dr. Gallup recommends the treatment of the disorder in New England by copious bloodletting. This treatment was unfortunately at his time carried to an extraordinary excess, and is evidently founded upon the absurd practice, then too much in vogue. Still, I would not be understood as absolutely condemning in all epidemics of this disease, the depletory treatment. It is possible that under certain circumstances it may be allowable, but in the cases which I have seen it would not be warranted by either the pathology or symptoms of the disorder.

If vomiting does not occur spontaneously, it is well to bring it about by a draught of warm water or a mild dose of ipecacuanha. The reason for this treatment is based upon the fact that the natural emesis should be regarded as a spontaneous mode of relief, or perhaps it may be caused by the necessity felt by the stomach to free itself of a quantity of matter which it cannot digest. This necessity is much more obvious in this disease than in most other affections, from the suddenness of the attack, which often strikes individuals in perfect health, without being preceded by the usual prodromes of disease.

Purgatives should not be trusted to; they would much annoy and enfeeble the patient without doing good. An enema may be given at the commencement and a light laxative soon afterwards; but this is merely for the purpose of unloading the bowels, not for having any special action on the disease. The food should, of course, be at first limited to diluent drinks; but if the disease last over a day or two I would give the patient essence of beef or some equally nutritious substance.

It is thus perfectly plain that the mode of treatment is based entirely upon a conviction that the important indications are to keep up the strength of the patient, and to combat, as far as possible, local symptoms until the

poison causing the disorder should be eliminated from the body. It is worse than useless to diminish the strength of the patient, for upon this we depend to carry him safely through the disease. This mode of treatment, I may state, has been generally followed by physicians who at first had been much less successful with the ordinary remedies used in the management of many acute disorders.

If I were disposed to mingle theoretical reasons with the absolute deductions of fact, I should regard the stimulant treatment as proved to be the most appropriate by the symptoms and the absence of decided structural lesions. The disease I believe to be produced by some unknown cause, which we may call poison if we choose, acting upon the body. A certain time is required for the elimination of it from the system, and during this process we must support the strength by appropriate food and stimulants.

Other remedies than those I have mentioned are appropriate to certain symptoms in spotted fever, but those, of course, will occur to every practitioner in every case he may be called upon to treat. I wished merely to indicate the mode of treatment on which we must rely, leaving details for the administration of every practitioner.

*Spotted Fever.*—Dr. LAMB, in response to an inquiry by the President, as to his experience in this epidemic, made the following remarks:—

In describing the anomalous disease which has recently given so much alarm in some of our suburban villages, it may be very proper to describe the general aspect or physiognomy of the patient, which is so remarkable, that when once seen, similar cases cannot be easily mistaken. It would be very difficult to describe the anxiety and intense suffering exhibited in the countenance of the patient. The jactitation is incessant, and the suffering without intermission. I will endeavour to describe some of the most striking cases as they were presented to my observation.

The first decided case I was called to, was in Frankford, on the 12th of March. The patient, J. McC., was a girl, in her eleventh year. She had been suffering since the forenoon of the preceding day. The mother had given her cathartic pills, which I suppose had operated freely; she had vomited frequently, and at the time of my visit was suffering from tenesmus, or imagined that she wished to pass something, desiring constantly to be on the close-stool, but without really having any evacuation. The child was constantly rising on her elbow, or turning from one side to the other, complaining of her forehead, back, and extremities. There was no sensible increase of heat; but a peculiar flush of the face, with a wild expression of feature, considerable dilatation of the pupils, which seemed insensible to the effect of a strong light. Tongue moist and slightly furred. Pulse irregularly intermittent, above ninety in the minute, distinct but not full, and easily compressible, no appreciable disturbance of the respiratory organs, no tenderness of the epigastrium or tension of the abdominal muscles, but extreme sensitiveness to the slightest touch or pressure upon the arms or legs. At 10 P. M. there had been no return of vomiting; in other respects no change was observable.

13*th.* The patient has spent a restless night, and the delirium which had been persistent from the beginning is unabated, though the attention could be gained, and she would seem to answer my questions with sense, and begged me to do something for her head. Pulse a little more frequent and more full. Some increase of heat about 2 P.M., when, for a few hours, there appeared on the arms and legs something resembling urticaria, vary-

ing from a few lines to an inch in length, slightly raised, as if produced by a blow from a switch, and uniformly pale red.

*14th.* The patient has spent another restless night. Pulse very irregular but yet distinct. The remarkable irregularity consisted in a frequency of about two and a half, and then suddenly falling off to one pulsation in the second, and this alternating from four to six times during one revolution of the second hand!

*15th.* The patient could be aroused, and responded slowly to my questions. Pulse still perceptible and irregular. Pupil of the right eye very much dilated, while the left pupil was contracted to a mere speck. At noon she was in a profound stupor, and ceased to breathe at 4 P. M.

In this case the alvine and urinary evacuations continued normal. There was no regular chill, but a slight daily exacerbation. During the last night and day the skin was pleasantly warm and moist. From the first there was no refreshing sleep; when the eyes were closed in apparent sleep for half an hour at a time, there was still no cessation of motion, nor was there any abatement of the delirium.

While this first case was under treatment, M. E. R., a girl of eight years, in a parallel street, distant about five hundred feet, was attacked. On the 13th she was at school, and out from home until 10 o'clock in the evening. The mother first ascertained that the child was ill about midnight. On the 14th her situation was very similar to that of the first patient. She became comatose about 2 P. M., and died at 5 P. M. on the 15th. A few specks, like flea-bites, might be seen on the neck and breast of this child.

After an interval of ten days, during which time no case occurred in or near Frankford, three cases came under my notice, all commencing about 8 P. M. on the 24th of March, two in the family of Mr. E. and the other in the family of Mr. R. The former, on the eastern side of Frankford, about six hundred yards east of the first two cases, and the latter about the same distance east of Frankford, in Bridesburg.

Miss M. E., aged nineteen years, had been uniformly healthy; she complained of acute pain in the forehead, with pain and excessive tenderness of the extremities. Some nausea, slightly delirious, pupils of both eyes dilated, skin moderately warm, face flushed, pulse about ninety, with frequent intermissions; circulation sluggish and deficient in power; a few small petechial specks on the legs and arms; tongue moist and slightly furred.

*25th.* Some improvement in the circulation; pulse eighty-four, full, but compressible. In the evening the pulsations were ninety-four with increase of delirium. Evacuations regular and normal.

*26th.* The patient has passed a very restless night, and the pulse exhibits the singular irregularity noticed in the case of J. McC. The general aspect of the case is more serious.

*27th.* A moderate catamenial flow commenced last night—ten days too soon. The patient is evidently sinking. But there is a remarkable steadiness of the pulse, almost approaching to a healthy standard. Pulse without intermission, and seventy-two in the minute, full; skin pleasantly warm and moist; breathing full and free. Had other conditions of the system been equally favourable, I should have felt that she had passed the crisis, and might recover. But she was then sinking into a state of insensibility, had nearly lost the power of deglutition, and died at 11½ P.M. Coma in her case did not become complete until about three hours previous to death.

The case of her brother, J. E., aged fourteen years, was in several respects different, and had a more satisfactory result. He had previously suffered from pulmonary disease, and the chief point of attack was now in the same organs. He had the intermittent pulse; the petechial spots and *congestion* of the lungs; same pain of the head, but no delirium. Within the first twenty-four hours he seemed in great danger of speedy suffocation, but the crisis soon passed, and after the fourth day he became convalescent. His recovery was perfect and rapid.

The third case occurring on that evening, Mrs. E. R., aged thirty-seven years, ran very speedily to a fatal termination. She took her tea as usual about 7 P. M. At eight she complained of acute pain in the head and giddiness. She was carried up to the bedroom in the arms of her husband. Body warm and extremities cold. Pulse irregular and intermittent, thread-like. Pupils greatly dilated, and vision very indistinct; delirious. Mrs. R. became comatose at 4 A. M., and died at noon, of the 25th, about fourteen hours from the first feeling of indisposition. In this case there were numerous patches or blotches on the body, face, and extremities; some having the appearance of ordinary ecchymosis, while others looked and felt as if the skin had been forcibly raised or pinched up, and blood effused so as to elevate the surface. These blotches varied in size, from three or four lines to three-fourths of an inch, with irregular points. It was ascertained that this patient had her catamenial flow out of time during the few hours of her illness.

In the family of Mr. E. where there were already two cases, a third, Miss A. E., was attacked on the evening of the 26th. I saw her within one hour from the first feeling of indisposition. The acute pain in the forehead and back were her first symptoms, and at this early stage of her sufferings the pupils of both eyes were dilated, the right eye much more than the left; the face was flushed, the body and extremities warm, pulse very slightly intermittent, not more than eighty-four to the minute; tongue moist and a little furred; extreme restlessness, and muttering delirium; some nausea, with occasional vomiting. At 8 A. M. on the 27th there was an increase of delirium, with a tendency to sink. The inferior extremities were covered with an efflorescent eruption, which might have been mistaken for rubeola or variola. From the knee down, the cuticle was perceptibly elevated, giving a feeling of decided roughness to the skin. Emesis was still troublesome; the matter thrown up seemed to be composed of dark bile mixed with mucus. She now complained of soreness and pain in the legs, with increased pain in the spinal column. The head was thrown back, forming with the cervical vertebræ a slight, but very decided curve.

*28th.* There seemed to be an improvement in the general aspect of this case. Pulse more full and regular, less delirium, but the tetanic appearance in the position of the head continued.

*29th.* No perceptible change. One of my medical friends from the city, who saw her to-day, thought she would recover. Her monthly flow has made its appearance out of time. On the 30th this patient was in the same condition, and so continues to the present time, giving strong hopes that she may be restored to health.

On the morning of the 27th the step-mother of these three children, Mrs. E. E., complained of slight pain in the head. Her age is twenty-nine years. She seemed exhausted from loss of rest and debility. Pulse intermittent. I advised rest and nourishment; but she maintained her

position by the bedside of her sinking daughter M. until the case terminated.

*28th.* I found Mrs. E. at 8 A. M. suffering from intense pain and soreness of the right thigh and leg, with a feeling of suffocation. The pain was in the course of the femoral vessels, just below the groin; the interval between that point and the knee was neither tender nor painful, but the knee and leg were so extremely sore that the slightest touch or pressure was agonizing. Pulse intermittent. Tongue covered with a light-coloured coat. Skin pleasantly warm. Evacuations normal, except that she was unwell at the middle of her period. The inferior extremities were covered with an eruption in all respects similar to that of the second daughter, and she continued to suffer until this, the fourth day, when I find her in all respects better. She has passed the crisis in safety, and will, in all human probability, recover.

In the few cases which have been under my care, I have seen no decided response to any remedial agent where the head was the chief point of attack.

*Cystic Disease in an Undescended Testis.*—Dr. HEWSON gave the following account of a case of this kind, operated on recently by him, and showed the diseased parts as removed, with a cast and photograph of them before the operation.

Although cases of disease of the testicle when retained in the inguinal canal have been reported by Chopart, Robert, and others, but little I find has been made known or written in regard to the history or diagnosis of such diseases. I have, therefore, thought it advisable to present to the College this evening, the specimen whilst fresh, removed by me from such a case at present in the Pennsylvania Hospital, with its history, as far as completed, and with a cast and photograph taken previous to the operation.

This patient is named Henry Faust, and was admitted on the 23d of March. He is a single man, 40 years old, a German by birth, a dyer by occupation, and has been living in Allentown, Pa., where he had enjoyed uninterrupted good health up to about three years ago, when he received a blow in the right inguinal region directly on the testicle, which was lodged in the canal there.

This occasioned a swelling, which soon became painless, but steadily increased until last December, when it had attained half the size the cast shows it to have been when he was admitted into the hospital. He then (last December) received another blow on it, which caused it soon to double its previous size. After this sudden increase in the tumour, the man's lower limbs began to swell from dropsical effusion. For this he was treated in Allentown, where it was also proposed to tap the tumour, under the impression that it was a hydrocele. He refused to submit to this operation, and came to the city.

On examining the tumour I found it irregularly ovoid, measuring around its base 19½ inches, across its surface in the line of its greatest diameter 11 inches, and across its surface, in that of the lesser or vertical diameter, 9 inches. It was firm but elastic to the touch, and the veins on its surface as well as those on the same side of the abdominal walls, were very much enlarged. The tumour was evidently beneath, at least the tendon of the external oblique, from the tension produced in the walls of the belly, from the crest of the ilium over to beyond the symphysis pubis. The upper part of the belly was perfectly soft and flaccid.

Coughing caused the tumour itself to move in a singular manner, by elevating the inner and depressing the outer end at the same moment.

No hernial succussion could be felt from this coughing.

The elasticity was considerable, especially at the apex of the tumour, but no fluctuation could be felt, nor could any light be transmitted through it in a darkened room.

At its base the tumour felt firmer and denser than at any other point, but did not appear to be firmly adherent to the bone or other tissue beneath.

There was neither œdema nor hydrocelic effusion in the scrotum, which, on the contrary, was quite empty, as the left testicle was also drawn up, partially, into its inguinal canal.

The only sensations the patient complained of were those of weariness and tension in the inguinal region. His countenance was somewhat sallow and anxious. His tongue was clean, and his pulse quite natural and tranquil. He presented the appearance of possessing his virile powers in their fullest extent. The age of the patient and his appearance naturally suggested, at first, the idea of this tumour being malignant, but its history and progress, and the sensations derived from its examination were against such a supposition, and the impression made on my mind, after a careful consideration of these circumstances, was that I had a case of cystic sarcocele to deal with, that the only means of relief was in complete excision.

This operation was undertaken with the concurrence of my colleagues, Drs. Norris and Pancoast, on last Saturday, the 28th of March, before the class at the hospital. I proceeded in it with as great caution as if I had a case of strangulated hernia to deal with, and, indeed, the existence of a hernia, in the midst of the morbid mass, had occurred to my mind as a possible complication. I made, first of all, an incision on the grooved director, along the surface in the direction of the greatest diameter of the tumour of at least 11 inches, through the integuments, and then through the tendon of the external oblique, so as to completely expose the whole mass. The tunica vaginalis was then reached. This was found very much distended and, on puncturing it, about a pint of clear yellow fluid, like that from a hydrocele, escaped. Then the testicle, with the epididymis and cord studded here and there with small cysts from the size of a pea to that of a filbert, was revealed, and all these structures were found much enlarged and diseased, the testicle and epididymis increased to at least three times their natural size.

These with the tunica vaginalis were carefully separated from the tissues beneath by the fingers and handle of the scalpel, exposing the peritoneum below the arch of the conjoined tendon for the distance of at least two inches. The cord was then found diseased so high up that I had to enlarge the external end of my original incision before I could get a ligature around it in a part where it was evidently healthy. This accomplished, the severing of the diseased mass from the remnant of the cord was effected by the ecraseur. The use of this instrument did not, however, prevent all hemorrhage, for I had subsequently to secure a vessel of considerable size in the stump left behind. The only other vessel which occasioned any amount of hemorrhage during the operation, was the epigastric, which was, of course, secured without much difficulty, as was also the superficial circumflex, and one or two small vessels in the bottom of the wound. The wound was then dressed with leaden sutures, and the patient put to bed and ordered ℥ss of solution of morphia, after he had recovered fully from the effects of

the ether. The whole operation occupied the greater part of an hour in its performance, and as but three days have elapsed, nothing can yet be said in regard to its result, but I shall take some future occasion to make it known. By the expiration of my term of service, for the present, at the hospital, the case has passed into the hands of one of my colleagues for after-treatment. The great extent to which the peritoneum was exposed in this operation necessarily endangers the patient's life from inflammation of that extensive and sensitive serous membrane.

As to so extensive a collection of fluid as that found in the tunica vaginalis in this case, escaping detection by transmitted light, after the careful examination given to it by my colleagues and myself, I have no explanation to give, unless it be that the tendon of the external oblique being stretched like a tent (of which the apex of the tumour represented the pole), prevented any position in which the light could pass through the fluid.

A minute examination of the portion of the cord removed in the operation, has shown it to be in a state of great hypertrophy, in the midst of which there is a streak of yellow, soft tissue, which, microscopically, has been found to be the same growth in a state of fatty degeneration, with here and there some tubercular matter.

In the lower part of the epididymis and in the testicle itself the fatty and tubercular deposits predominate, and are very extensive. There are the remains of some small cysts still to be seen in the substance of the testicle, as well as on the epididymis.

A fact of some interest to the anatomist was, in this case, the perfect character of the tunica vaginalis, enveloping as it did the gland and being completely closed around the cord above, so that no hernia could take place along the cord. A small band of apparently dense cellular tissue extended from the lower end of this tunic into the scrotum.

(*Addenda*, furnished by Dr. HEWSON to complete this history.)

This patient died on the 3d of April, a victim of erysipelas, which attacked simultaneously nearly all the patients who had been recently operated on in the hospital. His wound became œdematous, and gangrenous on the third day. His belly grew enormously tympanitic, and he sank in low muttering delirium on the sixth day. I had not the opportunity of witnessing the autopsy, but have been furnished with the following notes taken on the occasion by Dr. Richardson, the resident who had charge of the case.

Autopsy made April 4, 1863, 24 hours after death.

"*Lungs*. Contained a few scattered granular bodies which were not aggregated together, but may, perhaps, have been tubercular." (No microscopic examination appears to have been made of them.)

"*Heart*, healthy, but contained firm clots in all four cavities."

"*Liver* and *Spleen* normal."

"*Kidneys* appeared fatty, but no microscopic examination was made."

"*Intestines* seemed healthy, and *there was no peritonitis*."

"*Stomach* contained about ℥iv of black vomit, but its mucous surface presented no evidence of inflammation."

On the front of the spine and firmly attached to it from about the level of the 10th dorsal to that of the 4th lumbar vertebra, was a mass of substance, which was cut into while removing the mesentery, on the supposition of its being some enlarged gland. But, upon further examination, it was found to be about 1½ inches thick, and to have imbedded in it the abdominal aorta, still pervious; on tracing the vena cava ascendens downwards from the diaphragm to the right vein, it seemed to have become obliterated.

"Exploring the vena cava under the microscope, a portion of this has showed a great number of tubercle cells mixed with much fibrous tissue."

*Cataract.*—Dr. HAYS made some verbal remarks on this affection, of which the following is an abstract.

Dr. H. said he would offer for the consideration of the Fellows of the College some speculations which have lately been occupying his thoughts, and which, if well founded, would tend to invalidate a long accepted surgical precept, and also to elucidate the pathology of cataract.

There are few doctrines more firmly established, than that cataract is not amenable to medical treatment—that its progress can neither be arrested nor retarded by therapeutic measures—and that the only means of relief is a surgical operation. It certainly had been too often the speaker's painful task, when applied to by persons affected with incipient cataract and who anxiously inquired whether the progress of the disease could not be arrested, to be obliged to crush their hopes by the avowal that no such means existed, and that they would be obliged to abide their time and then trust to an operation for their relief.

It is difficult, indeed, to conceive how, in the existing state of physiological science—at all events, up to a recent period—any other opinion could be entertained. The lens is a transparent body inclosed in its capsule, without any vessels passing into it. How, then, was it possible to act on it by medicines?

It has been within a few years only that its mode of nutrition was understood. This is effected, as in some of the lower animals, by osmosis through its capsule.

I was first led to doubt the correctness of the doctrine under notice by the experiments of Dr. S. Weir Mitchell,[1] of this city, communicated to the Biological Society, Oct. 3, 1859, and published in the *Am. Jl. Med. Sci.*, for Jan. 1860. In experimenting with frogs by injecting syrup into their cuticular sac he found that the lens of the animal became opaque, and what was most remarkable that when the animal was replaced in water, after some hours the opacity diminished, and, in some instances, the transparency of the lens was entirely restored.

This last circumstance struck me as one which might lead to important practical results, and at all events it pointed out the direction in which our investigations should be made for that purpose.

Additional light was soon shed upon this subject by Dr. Richardson, of London, who, after reading Dr. Mitchell's paper, instituted a number of similar experiments, the results of which he communicated to the Medical Society of London on the 26th of March and 16th of April, 1860.[2] These experiments confirm Dr. Mitchell's results and throw much additional light on the subject. Dr. Richardson shows that cataract may be produced by the injection into the system not only of cane sugar, but also of grape and milk sugar—and likewise of glycerin, alcohol, of solutions of chloride of sodium, of acid urate of soda, and of lactate of soda. Death was also produced when any of these articles were introduced into the system in sufficient quantity.

Dr. R. concludes from his experiments that "as the cataractous appearance is modified by the density of the producing body, and is removable by

[1] On the production of Cataract in Frogs by the administration of sugar.
[2] See Am. Journn. Med. Sci., July, 1860, pp. 257–9.

reversing the conditions which led to it, and as it is producible in a clear lens removed from the body, it is a demonstration that the cataract induced in the different animals is a purely physical—that is to say, osmotic—change."[1]

Dr. Richardson advanced a step beyond this and suggested a practical application of this discovery.

"As a point bearing on the treatment of cataract," Dr. Richardson said, "that inasmuch as temporary opacity produced by exposure of the lens to syrup was removable by an after exposure to water (that is, by changing the position of the medium surrounding the lens), it was worthy of consideration whether an operation for letting out the aqueous humour by a small opening, and refilling the anterior and posterior chambers with distilled water, might not lead to removal of the cataractous condition in the earliest stages."

Soon after this, it was announced that M. Sperino, of Turin, had succeeded in curing cataract by repeatedly evacuating the aqueous humour. This was to some extent a confirmation of the value of Dr. Richardson's suggestion. M. Sperino was not led to this mode of treating cataract by any physiological reasoning, but rather empirically. "He had long derived great advantage from the repeated evacuation of the aqueous humour in cases of iritis, interlamellar keratitis, severe hypopion, staphyloma of the sclerotica, congestion of the choroid and retina (even when attended with exudations), opacities of the vitreous humour, and in pseudo-membranous deposits in front of the lens. Even in some desperate cases of glaucoma attended with commencing cataract, this treatment, useless as regards the loss of sight, was of use, a diminution of the opacity of the lens following the evacuation." M. Sperino promises to soon publish a work which will contain the results of his treatment of cataract by this method and show the kind of cataract to which this operation is applicable.

M. Sperino's operation consists in puncturing the cornea and preventing the puncture from uniting by introducing at short intervals into it a small probe, thus keeping up a drain of the aqueous humour. Mr. Hildige, of Dublin, professes to have tried this plan and without success; but he did not adopt M. Sperino's process. On the contrary, he made a fresh puncture at intervals, and these repeated punctures caused so much irritation and inflammation that he was compelled to desist.

These observations throw new light on the pathology of cataract, and seem to hold out a hope that remedial means may be discovered of arresting the progress of that disease, and, perhaps, even of restoring the transparency of the lens; but the physiological law which presides over the changes in the lens, and which was to guide us in our search for the means of controlling these changes, required to be more clearly determined.

In conversing, a short time since, with my friend Prof. Jackson on this subject, he informed me that experiments similar to those of Dr. Mitchell had been previously made by Kunde, and referred me to Claude Bernard's "*Leçons sur les propriétés physiologiques et les altérations pathologiques des liquides de l'organisme*," for an account of them.

In M. Bernard's lecture, delivered on the 11th of Dec. 1857, that eminent physiologist, to whose experimental researches we are indebted for

[1] It is just to Dr. Mitchell to say that although he believed that the direct contact of the sugar with the lens was essential to the production of what he called sugar cataract, he recognized the fact that the phenomenon was produced by osmotic action.

many advances in physiological science, merely briefly notices Kunde's experiments, without stating when they were made. In that lecture he, however, treats of the physiological importance of water to the organism, and the doctrines which he there develops seem to me to afford a physiological explanation of the production of cataract and to point out the direction in which our investigation for the means of remedying that condition should be directed.

M. Bernard shows that water is an essential component of all living organism—it is the necessary vehicle for the materials which enter into the double movement of nutrition and excretion—without which life cannot be maintained. "Independently of their special properties, the organic fluids," he says, "are allied by a general character; all owe their first physiological importance to the water they contain; before being useful in consequence of the substances which they may hold in solution or in suspension, they are first useful as fluids."

M. B. states that water constitutes nine-tenths of the whole weight of the human body; but the proportion of water to the solid constituents varies in the different fluids, being from 80 to 90 per 100 in the blood; 98 to 99 per 100 in the gastric juice; 70 to 80 per 100 in milk, &c.

Mr. B. next investigates the influence which the quantity of water in the organism exercises on physiological phenomena. To do this, he says, "two processes present themselves to the experimenter; one consists in detracting water from the body, the other in adding water to it. The first is difficult to accomplish. Nevertheless, Dr. Kunde has effected this in frogs, and observed some singular results. His process consisted in introducing into the intestinal canal of these animals some sulphate of soda or sugar; endosmotic action was thus induced which caused a part of the water of the blood to flow into the intestine; the blood was thus deprived of a portion of its water."

"One of the first results of this experiment was the loss of transparency of the crystalline—the animal becoming blind. This result quickly disappeared when the frog was replaced in water. Convulsions also resulted from this impoverishment of the blood of its water, very probably from the subtraction of the fluids which bathed the nerve, and these convulsions disappeared when the water which the system has lost was restored to it."

M. Bernard injected water into the veins of dogs, thus increasing the normal proportion of water in the system, and found he could do this to a considerable extent, without ill consequences; but so soon as the proportion of water exceeded certain limits, pathological results followed. Some of the secretions were first diminished, and as more water was injected, these secretions became entirely suspended, convulsions then supervened, and finally death.

It is thus seen that while the proportion of water to the solid constituents of the blood may vary within pretty extensive limits, without injurious consequences, yet so soon as these limits are transcended, pathological conditions at once result.

The only one of these which at present interests us, is the opacity of the crystalline lens following the diminution of the proportion of water in the blood below its physiological limits.

Dr. Mitchell supposes that the direct contact of the sugar with the lens is essential to the production of the phenomenon in question; but this is disproved by the experiments of Kunde and Richardson, which show that other articles that cause excessive exosmosis of the fluids produce the same

phenomenon; and, further, Hepp, who examined a diabetic cataractous lens, extracted by Stoeber at the ophthalmological clinic of Strasbourg, could not find in it a trace of glucose.[1]

Dr. Mitchell states, that the mere abstraction of water from the lens is insufficient to cause opacity, because the lens when dried does not become opaque. This statement, we believe, requires some qualification, and at all events when excessive exosmose from the lens is produced, the superficial nucleated cells and lens tubes are as a consequence emptied of their contents, and the structure of the lens is thus so altered as to render this body more or less opaque. This vacuity of the nucleated cells and lens tubes has actually been observed by microscopists in the examination of cataractous lenses.

Is this opacity of the lens then the consequence of the impoverishment of the fluids of the body of their water, which causes an excessive exosmosis of the more fluid contents of the lens, and impairs the nutritive functions of that body?

There are a number of facts which seem to lend support to this view.

Cataract most commonly occurs in advanced life, at which period the proportion of fluids to the solids is considerably diminished, and as correctly observed by Mr. Dixon, when the lens becomes cataractous in old persons, "the change seems to consist in a process of drying and atrophy of its fibres."[2]

Again, it is now a well-established fact, that cataract is a frequent consequence of diabetes. Is this not to be explained by the excessive excretion of fluid by the kidneys; and if this opacity is not always produced, may it not be owing to the water being replaced by the great quantity ingested, uncontrollable thirst being a constant attendant on the disease?

M. Bernard states that it is difficult to deprive the organism of its water, but he has overlooked the fact that this may be effected by certain medicines, as croton oil, tartar emetic, and the hydragogue cathartics, and is the constant result of several diseases, as diabetes, malignant cholera, profuse serous diarrhœa, leucorrhœa, &c.

In malignant cholera the exosmose of water into the intestines is enormous; the blood is so impoverished of its water that it becomes thick and dark as molasses. Is opacity of the lens one of the consequences of the loss of fluids in this disease? We are unable to answer this question, for we are not aware of any examination of the lens having been made after death from this disease. But we have often noticed a dulness and loss of transparency of the cornea, preceding death from this affection.

Artificial cholera may be produced by large doses of croton oil, or by repeated doses of emetic tartar, and experiments might be made on animals which would determine this point; and we would ask the attention of experimental physiologists to the subject.

Long continued copious serous diarrhœa, profuse leucorrhœa, and other exhausting fluid evacuations, impoverish the organism of its fluids, and, if our views be correct, must favour the formation of cataract.[3]

If it be objected to this that no such result has ever been noticed, let it be remembered that it is only within a very few years that the connection

[1] Lecorché, *Archives Gen.*, May, 1861, p. 737.

[2] Guide to the Practical Study of Diseases of the Eye, 2d ed., p. 216.

[3] There may be various other obscure diseases, which also alter the normal density of some of the fluids, and thus impair osmotic action.

between diabetes and cataract has been recognized, and that when attention shall be directed to this subject a similar connection may be discovered in other affections.

Should further investigations show that the long continued impoverishment of the blood of its water impairs the osmotic nutritive functions of the lens so as to produce opacity of that body, may we not hope that in some of such cases, by supplying to the organism its lost water, or by adopting the suggestion of Dr. Richardson or the practice of M. Sperino, the nutritive actions of the lens may be restored, the progress of the opacity arrested, and even, as occurred in the experiments of Kunde, Mitchell, and Richardson, that its transparency may be restored.

In very advanced age, it may not be possible to restore the proportion between the fluid and solid constituents of the body, for to do this would be to rejuvenate the individual, and senile cataract may therefore be regarded as beyond our therapeutical resources, as will be also those cases when the affection has advanced to that stage where the lens tubes have become broken up and actual structural alterations have taken place.

Congenital and traumatic cataract must be equally intractable to medical treatment, neither resulting primarily from impaired nutrition. The former is the consequence of arrest of development; and the latter is produced by exudation of lymph on the capsule, the result of inflammatory action. The capsule is then, of course, rendered incapable of performing its osmotic functions.

But when cataract occurs prior to senility—without any obvious cause—when the opacity has not far advanced, and especially when the impaired nutrition causing the opacity, is the sequel of exhausting evacuations, is it unreasonable to hope that the progress of the change in the lens may be arrested and even a retrograde metamorphosis effected?

The loss of transparency of the lens almost always commences in the layer of nucleated cells which connect the body of the lens to its capsule, the anterior marginal cells being first affected—the opacity proceeds in a centripetal direction implicating next the superficial softer fibres, and it is usually not until a late period that the denser fibres constituting the nucleus become affected. The mere arrest of the affection in its early stages while the nucleus is still clear, would be a great boon to the patient.

We might dwell further on this subject, for many points remain still to be developed, but we abstain for fear of too long trespassing on the patience of the Fellows of the college.

We shall besides have accomplished our object if we have succeeded in awakening attention to the subject—if we have excited the suspicion of our hearers that the conviction under which we have long rested of its being beyond the therapeutic resources of our art to retard, or in any degree control the formation of cataract, may not be well founded, and if we have indicated the proper direction in which our researches should be pushed in order to discover the means, if such exist, of attaining this very desirable object.

ART. XI.—*Summary of the Proceedings of the Pathological Society of Philadelphia.*

1862. *Feb. 12. Cysto-Sarcoma of Ovaries with Tubercular Degeneration: Tubercular Tumours upon the Parietal Peritoneum.*—Dr. A. H. SMITH presented this specimen, and gave the following history of the case:—

Mrs. R. aged 42, married 20 years, sterile, of nervous bilious temperament, delicate constitution, never robust, though not suffering at any period of her life from any manifest disease, became aware for the first time about 18 months ago of a decided enlargement of her abdomen, unattended at that time by any marked inconvenience or interference with the functions of the abdominal viscera. For two months after this discovery, the disease continued to progress, and finding it to interfere with her general health, she placed herself under the care of Dr. Ellwood Wilson. She was at that time quite feeble, with a miserable appetite, emaciated, skin cool and clammy, sleeping badly, languid and incapable of any active exertion. On examining the abdomen, which was greatly distended, there were found by careful manipulation two distinct tumours occupying either iliac region, that on the right side being much the larger. The patient was not at that time, or at any period afterward, in a fit condition for an operation for extirpation, even had such a remedial means been entertained. The abdomen continuing to enlarge, and the nature of the disease being clear, she was tapped on the right side and a considerable quantity of water drawn off, which gave great temporary relief; the left tumour did not appear to increase appreciably. The operation was repeated twice afterward upon the same tumour without the supervention of any other disease, either organic or functional. She gradually sank from mere exhaustion, and died on the 10th inst.

Yesterday, at Dr. Wilson's request, I made the autopsy for him, Drs. Morton and Scholfield being also present.

There was considerable emaciation; the abdomen much distended. Upon opening it, and removing about a gallon of straw-coloured serum, the lower two-thirds of the abdominal cavity were found occupied by the ovarian masses, the left being the larger, and extending over the median line. The right ovary consisted mainly of a firm fibrous mass, having an excavation of the capacity of about a pint and a half, opening by an orifice an inch in diameter, the effect of one of the punctures with the trocar, probably the last, as there was no extensive cyst remaining upon this side, merely a few scattered over the posterior surface of the tumour. The Fallopian tube of the right side and the cornu of the uterus into which it was inserted were both in a healthy condition. The left ovary, which had never been punctured, consisted of numerous cysts varying in size from a pigeon's egg to a large orange, imbedded in a mass which had at one time evidently been similar to that of the tumour upon the right side, and the external or iliac portion was still firm, while the inner half was in a state of degenerative softening, readily torn and in places of a pultaceous consistence; the oviduct of this side was greatly enlarged, as also the cornu of the uterus, and both structures exhibited the same degeneration. The cervix uteri was healthy.

The most interesting feature in the examination was found in the appearance of the peritoneum lining the anterior parietes of the abdomen, which

was studded with numerous excrescences varying in diameter from a few lines to an inch and a half, the smaller ones being spherical, the larger ones flattened and slightly concave upon their upper surface; they were of a pinkish colour, and the peritoneum surrounding them was considerably injected, though nowhere exhibiting evidence of inflammatory action either recent or old. The larger of these growths were seated near the umbilicus and beneath the hypogastrium, the smaller were scattered over the rest of the anterior peritoneal surface, none of these being found as far posteriorly as the iliac fossæ. The omental and visceral peritoneum was perfectly healthy and free from any of these growths, except that from the lower surface of the transverse colon was attached a pediculated pyriform cyst of the size of a goose egg, containing a thick gelatinoid transparent fluid. There was not the slightest evidence of disease in any of the other abdominal or thoracic viscera; no trace of tubercular deposit.

Upon examining these peritoneal growths they were found to consist of sacs, with fibrous walls about two lines in thickness, apparently a mere thickening of the serous membrane, within which was a creamy fluid, that proved under the microscope to be softened tubercle. The microscopic examination of the degenerated tissues of the ovary, oviduct and cornu of the uterus, proved it to be the result of tubercular softening.

I have carefully searched, and can nowhere find mention made of similar tumours to those found upon the peritoneum, nor in fact any reference to the occurrence of growth from the serous lining of the abdominal walls; tubercular tumours from the visceral peritoneum, however, being mentioned by several authors.

*April 22 Stricture of the Pylorus and Hemorrhagic Erosion of the Gastric Mucous Membrane.*—Dr. JOHN ASHHURST, Jr., presented and read the following communication from J. Campbell Shorb, Assist. Surgeon U. S. Army, Benicia Arsenal, California:—

A case, singular and complicated enough to demand a detailed history of its progress and termination, occurred a few weeks since in the U. S. Hospital under my charge, at Benicia Barracks, California.

George Steinburgh, a native of New York, a farmer by occupation, a private soldier of Company C, 4th Infantry, California Volunteers, aged twenty-four years, was admitted into the hospital on Nov. 13, 1862.

He made, in substance, the following statement in regard to his illness: Up to a very recent period his health had been excellent; but his stomach had suddenly grown irritable, and rejected almost everything he ate. This condition had lasted almost a month. His appetite was variable; often it was insatiable, sometimes entirely wanting; but whether he ate much or little, the same result was certain to follow, vomiting at a period varying from half an hour to two hours after his meals. His habits were strictly temperate, and always had been so. His physical appearance did not denote the existence of any grave disease. He was fleshy, but a little pale, and very dark beneath the eyes. His pulse was somewhat feeble, in all other respects natural. His tongue was moist and covered with a thin white fur, becoming somewhat yellowish at its base. His gums were pale, and, on pressure, bled easily. He was troubled with a slight headache almost constantly, and a mild fever, setting in toward sunset, which terminated generally about 9 P. M. in a slight sweat. He had daily an operation from his bowels, but it was scanty and clay coloured. He had no pain whatsoever over the epigastrium, except during the few moments immediately preceding

an attack of vomiting; even then it was more a sense of uneasiness or oppression than actual pain. There was no tenderness evinced on pressure during the whole course of his sickness, until three or four days immediately before his death.

The first plan of treatment was as follows: the case was supposed to be one of great irritability of the stomach, caused by congestion of its mucous surfaces, the result of a sluggish condition of the portal capillaries; and a purgative dose of hydrarg. chlor. mit. was ordered to be taken at once to arouse the portal capillaries, followed by two grains of blue mass, every night to render this action persistent. This treatment was continued for several days, but no improvement was manifested in any one respect In fact, the irritability had markedly increased; and there was every reason to believe the medicine acted kindly, for the stools, though still small, had assumed a healthy natural colour. Abandoning the idea that the symptoms were due to the condition described, I imagined they might originate in some functional disorder of the spinal column, or other centres from which nervous supply is furnished the stomach. He was blistered behind the ears, cupped and blistered on either side of the spine, at a point corresponding to the cœliac axis, or position of the semilunar ganglia, but no good result followed.

It did not seem probable that the irritation was dependent on any particular article of diet, for solid or fluid, digestible or indigestible substances gave rise to the same phenomena. However, a strict diet was directed and persevered in for some days, the result being as unsatisfactory as ever.

The case was then treated as one of perforating ulcer of the stomach; though many doubts arose in reference to the question whether the existence of such a condition would be attended with the peculiar symptoms found in the present case. There was no circumscribed pain; no tenderness on pressure; no sign of blood in vomiting, up to this period. The matter ejected from the stomach was food partially digested, mucous secretions, at times quantities of a glairy fluid or a liquid resembling saliva.

Bismuthi subnitras and argenti nitras were administered according to the following formula: ℞.—Bismuthi subnitras ℈ij; argenti nitras gr. x; extract. glycyrrh. pulv. gr. v; acaciæ gum. mucil. q. s. Misce et fiat massa in pilulas No. x dividenda. Sig.—One pill every four hours.

This prescription was continued for four or five days, but the man grew steadily worse. The history of the case precluded the probability of its being chronic gastritis or a subacute variety of that disease. However, I directed a large blister to be placed over the epigastrium, hoping that some benefit might result from its action; issuing, at the same time, strict orders in reference to his diet, and giving him alternately small doses of creasote and chloroform in water.

A new and fearful symptom, at this stage, was added to the rest; viz., hemorrhage from the stomach. The blood was ejected by active vomiting at first. Large quantities of very black and thickly clotted blood were thrown up at gradually decreasing intervals. I tried opium and lead, ergot and kino, tannin and iron, severally and in combination; but, far from checking, they did not seem to lessen the discharge. It now came up by a species of regurgitation; out of his nostrils, out of his mouth, in one unceasing flow. He weakened rapidly; a series of fainting spells came on, terminating at last in a mortal syncope. He died at 3 o'clock A. M., on Dec. 13, forty-eight hours after the first appearance of the hemorrhage, and thirty days from his admission into the hospital.

*Autopsy made nine hours after death.*—The body was of snowy whiteness and but little emaciated. Rigor mortis was well marked. The brain was not examined. The heart was healthy; also the lungs, except at the summit of the lung where there was a slight adhesion, the result seemingly of an attack of pleuritis in early life. The liver was natural in size and consistence, though paler than it ordinarily is. The spleen was healthy; its capsule flaccid, and its parenchyma of proper colour and consistence.

The stomach, when first exposed to view, resembled a section of the transverse colon, or a small sack with thin semi-transparent walls containing an inky liquid. It was much diminished in size, and wonderfully so in thickness. On opening the organ I found a condition different from anything I had ever seen, and answering only to a disease described by Rokitansky [*Pathological Anatomy*, Syd. Soc. Translation, vol. ii. p. 34], and denominated "Hemorrhagic erosion of the gastric mucous membrane."

The first great sign of disease evinced on inspection was the wonderful loss of substance. The whole organ emptied of its liquid contents did not weigh over one ounce and a half, probably less than one-third of the weight of an ordinary adult stomach.

A coagulum, brown in some places, growing black towards the pylorus, covered the whole internal parietes. This, removed with the finger-nail or scalpel, revealed immense numbers of small round spots of various sizes, the largest corresponding to the diameter of swan shot, and the smallest to the diameter of clover seed, increasing in number from left to right until within half an inch of the pylorus, they appeared in thickly set clusters leaving no interstices between them. Some of these, apparently, were entirely denuded of mucous membrane; while others and the greater number were still covered by the membrane, but it was much diseased, being dark red, and so soft that it broke from the forceps, and, squeezed between the fingers, became pulpy. Careful examination was made for ulcers, and three or four were found. These were for the most part quite superficial, but one seemed to have eaten through the membrane, having for its base either the submucous cellular tissue, or the muscular structure itself. Underlying the lesser curvature, midway between the cardiac and pyloric orifices, there was a bright red circular spot an inch and a half in diameter, where the mucous membrane, though seemingly congested within one degree of hemorrhage, was evidently more healthy than in any other portion.

At the pylorus, there was found an impermeable stricture; and it was this condition I believe that gave rise to the whole series of morbid processes that eventuated in death. There was a cadaveric contraction of the muscular fibres encircling this outlet, but the condition found was altogether different from that contraction; not even admitting a small sized probe. Most careful examination was made for signs of previous ulceration, but no cicatrices could be discovered.

The stricture had been gradually growing worse all the time, and for days before death had effectually and absolutely cut off all communication between the stomach and duodenum. Immediately under the mucous membrane covering this sphincter, there was an effusion of a yellow liquid, resembling bilious matter, and in quantity certainly not over half a fluid drachm. No sign of even the beginning of malignant disease could be discovered; in fact examination failed to reveal anything that could clear up the mysterious cause of this morbid condition.

In the progress of the case, it was remarked that no bilious matter was ejected from the stomach; now the reason appeared obvious; the commu-

nication was cut off between the duodenum and the stomach; and it seems singular that this fact alone did not lead to the suspicion that there was some functional or organic disorder of the pylorus.

The erosion of the gastric mucous membrane can scarcely be deemed in this case an idiopathic affection. The low condition of the system caused by the pylorus preventing an egress of nutritive material from the stomach, powerfully predisposed to the production of the disease; and then the wear and tear of the stomach in the ceaseless agonies of vomiting, must have kept the organ constantly in a state of congestion bordering on hemorrhage; a condition of things which if continued must always result in serious organic mischief, and ultimately sap the foundations of life.

*May 2. Phthisical Vomica in Base of Right Lung.*—Dr. JOHN ASHHURST, Jr., reported the following case:—

J. L. F., aged 50, a seaman, admitted to the Pennsylvania Hospital on January 27th, 1862. The diagnosis made was phthisis, but at no time during life was an abscess suspected, probably from attention not having latterly been directed to the base of the lung. He died on the 21st of May from colliquative diarrhœa, and an autopsy was made 7½ hours after death. A very large abscess was found in the mediastinal space communicating by a narrow passage with another in the lower lobe of the right lung. Several patches of tubercle with commencing softening were found in the upper portions of both lungs.

In the liver were several accumulations of puriform liquid, which, however, under the microscope, showed no pus cells whatever.

There was no communication from the liver to the mediastinal abscess.

The pericardium was completely adherent. The heart itself presented no evidence of disease.

The large intestine was very much ulcerated, but was not found to contain any tuberculous deposit.

The other organs which were examined appeared normal.

*Case of Acute Poisoning by Alcohol.*—Dr. JOHN ASHHURST, Jr., exhibited the brain of the patient, and read the following account of the case:—

Julia H., aged about three years, was admitted into the Pennsylvania Hospital about twenty minutes past ten on the evening of Sunday, May 25th.

Dr. Joseph Shippen, who was called to the case before its admission, has courteously furnished me with the following particulars.

The child had been given by her mother, who was herself excessively intoxicated, two teacupfuls, I suppose about half a pint, of whiskey; two physicians had been sent for, but had successively resigned the case as hopeless without any effort, and Dr. Shippen was therefore the third practitioner who had seen the child. He found it cold, almost pulseless, and in a state bordering on complete collapse. He instantly administered thirty minims of the aromatic spirit of ammonia with a teaspoonful of the fluid extract of valerian, with the effect of rousing the patient and causing a profuse emesis. He also plunged the child up to the breast in a hot bath and retained it there until the capillary circulation of the skin became more active, as indicated by a general redness of the surface. When vomiting took place, along with the contents of the stomach was brought up a large quantity of frothy mucus expelled from the air passages.

When admitted to the hospital, although partially reacted, the child's

condition was critical in the extreme. The skin, though not absolutely cold, was clammy and relaxed. The pulse extremely weak and so frequent that it could scarcely be counted; the breathing exceedingly rapid, and each expiration followed by a peculiar moaning sound; the pupils widely dilated and immovable. The child was delirious and disposed to be restless. A sinapism which had been applied to the chest had not even reddened the skin. Having placed the child in bed and covered it warmly, I directed turpentine stupes to its chest, front and back, and large mustard plasters to its lower extremities: carbonate of ammonia in $1\frac{1}{4}$ grain doses was administered every quarter of an hour. Auscultation at this time showed great congestion of both lungs, without, however, any absolute inflammation. The action of the heart was rapid and feeble. About three-quarters of an hour later, on again applying my ear to the chest, I found mucous rales throughout, showing that effusion was rapidly going on. I was called to the child again at twelve o'clock, and on entering the ward found that she had just expired.

Neither the turpentine nor the mustard had in any degree reddened the skin. The left arm appeared much swollen and mottled.

An autopsy was made fourteen hours and a half after death with the following results. The whole body appeared bloated and livid in patches.

*Head.*—The membranes of the brain were much congested, the venous trunks being gorged with black blood. The brain substance was soft, but perhaps not more so than customary in children. The minute vessels of the dura mater were beautifully injected; the ventricles appeared natural; the brain substance studded with small red spots.

*Thorax.*—The lungs very much congested, of a dark-red hue, and the air passages filled with frothy mucus. The lung tissue floated in water, but floated almost entirely beneath the surface. The right cavities of the heart contained large clots of a "currant jelly" colour, and the great venous trunks were filled with dark fluid blood. The left side of the heart and aorta was empty.

*Abdomen.*—The stomach presented a patch of very slight redness near its cardiac orifice, but throughout the remainder of its extent appeared perfectly healthy.

The bladder was very much distended with urine. The liver rather pale; the kidneys and spleen healthy. The serous membranes throughout the body were completely free from adhesions.

The immediate cause of death in this case seems to have been the stoppage of respiration from accumulation in the air passages of mucus, which in so young a child could not be expectorated.

"The quantity of alcohol required to destroy life," says Taylor [*On Poisons*, &c., 2d ed. p. 726], "cannot be fixed." It must depend on the age and habits of the person. The smallest quantity known to have proved fatal was in the case of a boy, æt. 7, who swallowed two wine-glassfuls of brandy (between three and four ounces). Here death took place in thirty hours.

Dr. Percy records a case in which the post-mortem appearances were almost precisely the same as in mine.

According to Mr. Bedingfield, as quoted in *Edinb. Med. and Surg. Journal*, xii. 489, the patient will recover if the iris remain contractile, but if it is dilated and motionless on the approach of a light, recovery is very improbable.

In acute cases (such as mine), the mucous coat of the stomach is not inflamed; when it is so, Dr. Ogston considers it rather to arise from fre-

quent drinking to excess, than from the dose which may finally prove fatal. [*Edinb. Med. and Surg. Journal*, xl. 292.]

An overdose of alcohol may prove fatal in a few minutes, or not until after several days. Fatal cases, however, generally terminate within twenty-four hours.

*June* 11. *Old Apoplexy: Pericarditis: Single Kidney: Bifid Uterus.*—Dr. PACKARD exhibited a kidney, bladder, and uterus, with the following history of the case from which they were derived:—

Mrs. M. L. C., æt. 53, had suffered for several years with symptoms indicating cerebral disease. Some doubt existed as to whether there was not also some lesion of the stomach. The immediate cause of death was exhaustion from suffering and imperfect nutrition.

Body very much emaciated. Some little rigor mortis. Skull very thick, and destitute of diploë. There was some turbid serum under the arachnoid. The brain matter generally was softened and wet, the right side being more so than the left. In the corpus striatum of the left side there was an apoplectic clot, perhaps one-third of an inch in diameter, evidently of some standing, and the surrounding cerebral substance was somewhat wrinkled. The right lobe of the cerebellum was soft, the markings of the arbor vitæ curiously indistinct, and the corpus dentatum wanting. All the arteries about the base of the brain were atheromatous.

Both lungs were healthy, although the left was somewhat adherent at its apex, and a small tubercular deposit, apparently in process of cretefaction, was observed in the corresponding lung-tissue.

The heart was large and fatty. Between the layers of the pericardium, around the base of the organ, lymph was deposited, evidently long ago. It was in sheets, with a smooth granular surface, and could easily be stripped off. One flap of the mitral valve was adherent. All the other valves were healthy.

On opening the abdomen, an enormously thick and fatty gastro-colic omentum was observed. It had adhesions at irregular points to all the viscera, including the uterus, and to the abdominal walls.

The stomach lay in a nearly vertical position; it was entirely normal. The liver was fatty; a large gall-stone distended the gall-bladder. The spleen was small, and upon section showed very numerous specks of whitish deposit like tubercle; microscopic examination did not, however, reveal any special type of cell.

The left kidney was wholly wanting, with its capsule; the organ of the right side was of more than average size. No sign of the left ureter existed in connection with the bladder, which was large and flabby, but otherwise normal.

The uterus was bifid, the separation between its lateral halves extending almost to the lower extremity of the organ; the os uteri was single. Just below the posterior lip of the os uteri there was a little transverse bridle of mucous membrane, like a perforated valve. It seems strange that this should have been unruptured in any of her four confinements.

As regards this abnormity of the kidney, it will perhaps be remembered that at the first meeting of the society in October of last year, I exhibited a specimen of a very similar character, taken from a male subject.

*Case of Aneurism occupying the Popliteal Space; operation; death on the 23d day.*—Dr. JOHN ASHHURST, Jr., exhibited the specimen, and read the following report of the case:—

Josiah Williams, aged 50 years (for the opportunity of presenting whose case I am very much indebted to Dr. Robert S. Kenderdine, one of the attending surgeons to the Philadelphia Hospital), was admitted to that institution on the 10th of December, 1861, complaining of pain and swelling of the posterior part of the left knee. He was referred to the medical ward as a case of chronic rheumatism, and was there treated by three of the attending physicians in succession, without any change being made in the diagnosis of his disease. He stated that the swelling had originally begun on either side of the joint, but had before long involved the whole ham in one common tumour.

In the beginning of May, 1862, the resident physician in charge of this patient thought he discovered fluctuation at one point of the tumour, and accordingly introduced a bistoury. No pus, however, followed the withdrawal of the instrument, but a small quantity of a serous fluid.

On the 8th of the same month the patient was transferred to the surgical ward, and on that day was first seen by Dr. Kenderdine.

The man was of large frame, pale, with very prominent eyeballs; the left limb much bent at the knee; the tumour very large, and filling the whole popliteal space; the foot much swollen.

Deep pulsation could be felt upon firmly compressing the tumour, but there was no aneurismal thrill. The skin was very much discoloured and livid, and several openings were shown by the probe to communicate with dead bone. The exploring needle was twice introduced without eliciting any information.

Dr. Kenderdine informs me that from the moment he saw the case, he believed it to be aneurismal; and that he had resolved, in view of there being already an opening made into the sac (in the medical ward, a few days previously), to enlarge this incision, and should his diagnosis prove to be correct, proceed at once to turn out the clots, and tie the vessel at the points of entrance and exit.

As it happened the aneurism, for such it proved to be, burst while it was yet being examined, and of course the operation was at once proceeded with, the man having been brought under the influence of chloroform.

I should mention that in view of the disease of the bony structure, amputation had been proposed to the patient, but positively refused by him.

The incision was rapidly made, and the clot turned out, when the entering orifice of the artery became apparent. Several ligatures, which were successively applied, cut through the diseased coats of the vessel, and it was not until the artery had been dissected free from the surrounding tissue, and traced into healthy structure, that it could be finally secured; a large branch coming off immediately above, was also tied. The orifice of exit, although carefully searched for, could not be found; and, therefore, the wound being stuffed with lint, dry above and below wet with the solution of the persulphate of iron, was loosely brought together with adhesive strips, a provisional tourniquet placed around the thigh, and the limb elevated.

The contents of the sac, when removed, filled an ordinary hand basin. There was not much arterial blood lost during the operation, and the man, under stimulus, reacted well. On the next day the collateral circulation was fully established, and the swelling of the foot was considerably less.

On the fourth day some diarrhœa occurred, which, although kept in check by opiates and astringents, continued from this time. The ligatures came away upon the tenth day, and the man continued as favourably as could be desired until the 28th of May, when, from no apparent reason, he began to sink, and died three days subsequently, the 31st of May, and the twenty-third after the operation.

An autopsy showed the arteries above and below to be filled with firm coagula, and the sac to have very much contracted. The articular surfaces of femur, tibia, and fibula were greatly diseased.

The spleen was softened, and contained a collection of matter resembling pus.

The operation performed in this case is of no recent origin. Not less than 1530 years ago, Antyllus, to whom is attributed by Sprengel the invention of the ligature, operated for aneurism by tying the artery above and below, opening the tumour, evacuating its contents, and introducing such substances as would promote suppuration.

Philagrius, some years afterwards, modified this proceeding by dissecting out the entire mass, after tying the vessel both above and below.

Mr. Porter, of Dublin, in his treatise on aneurism, published about twenty years since, advocates the operation by opening the sac in certain cases of diffused and traumatic aneurism; but in the immense majority of cases recommends the operation of Hunter, as the best and only justifiable proceeding.

Mr. Syme, of Edinburgh, in his charming *Observations in Clinical Surgery*, published last year, gives several cases in which he operated by this the "old operation" in various parts of the body with most gratifying success, and expresses the opinion that the "generalization" in favour of the adoption of the Hunterian method in every case is "no less unjust than hasty."

In cases of popliteal aneurism he prefers still the ligature on the cardiac side of the tumour, as in the ordinary operation; but the case I have had the honour of reporting was exceptional. The sac was already opened, and suppuration would, therefore, almost certainly ensue. Even had the sac not been opened, the size of the tumour was so great as to render absorption at least problematical; and, under these circumstances, I think every one will agree, upon careful reflection, that but one of two courses would have been justifiable; either the operation as performed, or amputation, which, as I have already mentioned, was peremptorily declined.

The occurrence of gangrene after the ligature of arteries is due, according to Porter, to the pressure from the tumour, and not to the impediment to the arterial circulation. It is moist gangrene from venous congestion, not dry gangrene, as in the cases of embolus which are occasionally met with.

After the Hunterian operation the tumour frequently increases rather than diminishes in size; and by coagulation the pressure becomes continually greater, while, by the old Antyllian method, the pressure is at once removed, and the probability of gangrene is almost entirely done away with.

The fear of hemorrhage during the operation should not deter any one, for a single finger will easily control the most powerful arterial jet.

*Subpleural Abscess connected with Ununited Fracture of Eighth Rib.*—Dr. Agnew presented, for Dr. C. H. BOARDMAN, a specimen, and gave the following history of the case from which it was derived:—

The accompanying specimen, consisting of an abscess beneath the pleura,

with a fracture of the eighth rib, was taken from a negro girl, æt. 22, a patient in the medical wards of the Philadelphia Hospital. Its history, as nearly correct as possible, is as follows:—

The girl was admitted to the hospital February 15, 1862. She complained of a continuous acute pain in the right side, and was suffering at the same time with a cough and general debility; in fact, she was almost in a typhoid condition. Her appearance was decidedly strumous.

Upon examination an opening was found upon the right side, apparently communicating with the cavity of the thorax, and caused by a fracture of the eighth rib, which was ununited, and carious at its broken extremities. It discharged constantly and copiously a highly offensive sanious pus. The thorax was *somewhat* dull on percussion; most dull on the unaffected side, and there were no evidences of the participation of the lung itself in the injury. Auscultation revealed the physical signs of phthisis, best marked upon the left side, which was borne out by the general symptoms, while a *plashing* was readily recognized upon the injured side. The pulse was small and frequent; the general condition feverish and restless. The patient complained only of pain upon the right side, but was somewhat annoyed by difficulty of expectoration and by participation of the larynx in the tuberculous affection. Questions elicited the following account: Three or four months previous to her admission to the hospital she had been violently kicked in the side and beaten by her master or employer in Delaware. By degrees the abscess had been developed, while her health had suffered to a corresponding extent. No effort had been made to procure a union of the fracture; of the existence of which, indeed, she had not been aware.

Her treatment, in addition to tonics and stimulants, consisted of counter-irritants, principally, with a view to relieve the inflammation of the pleura which was supposed to exist, the diagnosis being pleurisy with effusion. Temporary relief only was obtained; the patient remained stationary for a few days, when she gradually sunk until she died on the 7th of March, having lived in the house three weeks.

An autopsy was made with the following result: The opening in the right side communicated, as had been supposed, directly with the corresponding pleural cavity. The sac was covered over most of its surface with fringes of greenish imperfectly organized lymph, and contained about two pints of the pus which had manifested its presence so profusely during life. The lung was much compressed, and forced into the upper part of the thorax. The adhesions were remarkably firm. In the left thoracic cavity, upon the removal of the lung, which was highly tuberculous, the accompanying specimen, which had not been recognized during life, was discovered. It consists of an abscess between the intercostal muscle and the pleura, pointing within, and apparently nearly ready to burst. Neither it nor its cause, the fractured rib, were discovered until post-mortem, as the symptoms and complaints of the patient had confined all attention to the opposite side.

No pathological condition was discovered in any of the other viscera.

*June* 25. *Valvular Disease of Heart.*—Dr. JOHN ASHHURST, Jr., presented a specimen of this, and read the following history of the case:—

J. M. R, æt. 53, a house-carpenter by trade, was admitted into the Pennsylvania Hospital on the 10th of June, 1862. For many years he had suffered from hæmorrhoids, which latterly, however, had not bled. In

1840 he was laid up with a cold which lasted between five and six weeks, and afterwards suffered from chronic diarrhœa, which annoyed him more or less for six years. From 1846, however, until last February he had enjoyed good health; on the 22d of that month he had caught cold again, and had been ailing since.

His principal complaint now was of excessive shortness of breath and debility. He was much swollen about the lower extremities, and had also some œdema of the trunk.

His liver was evidently enlarged; his urine contained no albumen; auscultation betrayed a cardiac murmur, not however very striking, and slight dulness; the crepitant râle and friction sound at the lower part of the left lung, posteriorly, showed a slight amount of inflammation; bronchophony was present, but not marked.

A stimulant and tonic treatment was resorted to, and no change was apparent until the morning of the 12th, when his body, especially his arms and legs, were found covered with numerous vibices.

Muriated tincture of iron, with oil of turpentine, and increased stimulation were now employed, but dyspnœa gradually increased until his death, which ensued on the 14th about 4 A. M.

An autopsy was made 13½ hours after death with the following results:—

*Thorax.*—The heart was much enlarged and fatty; there was an enormous deposit on the mitral valve; very large clots, partly fibrinous and partly resembling currant jelly, filled the ventricles and the aorta and pulmonary arteries. The lungs appeared healthy, except in the lower lobe of the left lung, which was consolidated seemingly from an old pneumonia. There was great serous effusion in the cavities of both pleura and pericardium.

This effusion, the fatty condition of the heart substance and the depressed state of the circulation, no doubt masked the abnormal sounds, which certainly did not indicate the great amount of valvular disease which was found in the mitral region.

*Abdomen.*—The liver was enlarged and fatty; the spleen large and lobulated; the kidneys fatty, especially the right. There was considerable serous effusion into the cavity of the peritoneum. The other organs examined appeared healthy.

It was suggested by Dr. Levick that the petechiæ and vibices in this case were due to the depraved state of the blood, resulting from partial putrefaction of the heart clots while life was yet present. Whether such a connection can justly be traced I am not prepared to say; but that petechiæ and fibrinous clots in the ventricles co-exist I am sure is often the case.

On the 8th of January last I reported to the Society the case of an old man who died with a very similar condition of affairs. He too had for a long time suffered from an affection of the lungs, which, however, had not given him much annoyance, and which under treatment for cystitis became suddenly covered with petechiæ, and he died within twenty-four hours. At the autopsy "both ventricles of the heart were filled with enormous fibrinous clots which extended into both the aorta and pulmonary artery, nearly filling their entire calibre." [*Am. Journ. of Med. Sci.* for April, 1862, p. 421.]

It is very much to be regretted that in the case to-night reported the sounds of the heart could not have been more accurately noted; but the patient was so restless, groaning, tossing himself about, and for some time before death almost unmanageable, that it was impossible to distinguish with any approach to accuracy what the abnormal sounds were.

*Obscure Case of Supposed Injury to Brain.*—Dr. JOHN ASHHURST, Jr., read the following account of this case:—

Mary G., Irish, aged 40, a widow, was admitted to the Pennsylvania Hospital on Sunday, March 23d, 1862, about 3 P. M.

She was said to have fallen down stairs the evening previous, and had been pronounced by a medical man, who had seen her previous to her being brought to the hospital, to have a fracture of the skull with, it was said at first, symptoms of concussion of the brain, which had however at this time disappeared.

Her condition when admitted was as follows: Her pupils were nearly natural; the left slightly more dilated than the right, but both responding to the stimulus of light. From the left ear was a discharge of what appeared to be bloody serum, small in quantity but constantly accumulating. The mouth was very slightly drawn towards the right side.

Her eyes were kept shut, and she remained continually in a state of profound insensibility, varied with occasional violent and semi-spasmodic motions of both upper and lower extremities. The limbs of the left side were, however, much less thrown about than their fellows. Her pulse and respiration were throughout quite normal.

The left radius was broken obliquely at its lower third. No fracture of the skull was detected.

Her condition did not vary materially from the above during the ensuing night. Her urine was passed involuntarily. While in the state of insensibility above described her limbs remained perfectly rigid, except when thrown about by her half-convulsive movements.

The next morning, Monday, her condition was very much the same. She could now be roused from her lethargy and would articulate a few words before relapsing into the soporose condition. By tickling the soles of her feet the rigidity of her arms would suddenly give way, a phenomenon which gave rise to the suspicion that her condition was epileptic. A sinapism was applied to the nape of the neck, the head shaved, and an evaporating lotion composed of tincture of camphor, alcohol, and ether occasionally made use of.

On Tuesday, March 25th, the paralysis on the left side of the face was very well marked; the tongue, when protruded, inclined slightly to the affected side. There appeared also some paralysis of the entire left half of the body. When addressed she replied in a sharp querulous tone, her sentences interspersed with what almost amounted to shrieks. Her mind was evidently far from being in a normal state.

A microscopic examination of the discharge from the left ear showed the existence of blood corpuscles in abundance, some oil globules, amorphous granules, etc.; without, however, anything resembling pus.

From this time she has gradually improved, and left the hospital last Monday, June 23d, with but a slight distortion of face when speaking, and *bizarrérie* rather than dulness of mind. I have brought this case before the Society as interesting in connection with the various examples of injuries to the head which I have from time to time reported. The pathological condition in this case I have no doubt is a fracture at the base of the skull involving the petrous portion of the temporal bone. This would account satisfactorily for the various symptoms, and nothing else, so far as I know, could account for the peculiar non-purulent discharge from the ear. What the result in this case will be, it is hard to say; not improbably an

abscess may eventually form in the brain and become the immediate cause of death.

I had last autumn in the hospital a very interesting case of what seemed to be typically concussion of the brain. In this case strabismus and orbital ecchymosis came on subsequently to admission; violent delirium for several days required mechanical restraint; and of the occurrences during this period the patient was totally unconscious when the maniacal paroxysm had passed off. He remained in the house some weeks, at the end of which time the only evidence that he was not well was an occasional foolish remark.

He left the hospital contrary to my advice, and after going about his usual avocations for some days fell down and died. I was not invited to be present at the autopsy, but was told that an abscess of the brain and a fracture of the skull had been found to exist.

Abscess of the brain may result from injuries received long prior to death. Forbes Winslow records cases in which the causes were four, six, and even ten years previous to the fatal issue.

*Comminuted Fracture of Skull.*—Dr. C. C. LEE presented a specimen of this, and gave its history as follows:—

Hugh R., æt. 53, was admitted into Pennsylvania Hospital June 22, at 1 A. M. Two hours before, while coming down stairs with a child in his arms, he had fallen forward about 10 feet, as was supposed, upon his head. When admitted he was speechless and moaning, but showed some signs of intelligence; the pupils were of normal size but immovable; there was no paralysis or blowing expiration, and the coma was very light; in a word, the case resembled rather concussion than compression of the brain. The scalp was uninjured, but under it was effused a large amount of blood, and although fracture of the skull was feared, it could not accurately be determined. Cold to the head, counter-irritation, and stimulants were employed, but the patient sank slowly and died 16 hours after entering the house. At the autopsy a large quantity of blood was found, as expected, under the scalp, and when this was removed it revealed an extensive radiating fracture, involving the occipital, right and left parietal bones along their lower margins, and the squamous portion of the left temporal bone; on the left side the fracture was comminuted, and a piece of the lower edge of the left parietal bone was considerably depressed; the lines of fracture were confined to the sides and base of the skull; the vertex and orbits were not affected. The membranes were extensively lacerated, and large, diffused clots covered the surface of the right hemisphere and a considerable portion of the left, thus, perhaps, accounting for the absence of marked hemiplegia. The total absence of orbital ecchymosis is also noteworthy, for the fracture extended nearly across the base of the skull.

# REVIEWS.

Art. XII.—*A Treatise on the Continued Fevers of Great Britain.* By Charles Murchison, M. D., Fellow of the Royal College of Physicians, Senior Physician to the London Fever Hospital, &c. &c. &c. London, Parker, Son & Brown, 1862. 8vo. pp. 638.

Dr. Murchison's treatise is a valuable contribution to medical literature. Such a work was called for. As the author remarks, notwithstanding the great advance of late years in our knowledge of the continued fevers, no systematic elaborate treatise on these fevers has been published by any English physician for nearly a quarter of a century. We have had in this country the excellent treatise by Bartlett; but important additions to our knowledge have been made since the latter work was written, and, moreover, the periodical fevers and yellow fever being included in Bartlett's treatise, the space devoted to the consideration of continued fevers was necessarily somewhat limited. We are glad that Dr. Murchison has restricted himself to the continued fevers. As a class, these are sufficiently isolated from other fevers to be considered separately, and they form a province of practical medicine sufficiently extensive to require a volume.

The work is divided into eight chapters. Chapter I. is devoted to introductory remarks on the theory of fevers, etc. Chapter II. is occupied with the consideration of typhus. In Chapter III. relapsing fever is considered. Of Chapter IV. the subject is typhoid fever. In the remaining chapters are discussed the specific distinctions of typhus and typhoid fever, the symptoms and varieties of simple continued fever or febricula, the rate of mortality of continued fevers, and the importance of isolating fever patients in hospitals. A copious bibliography, arranged chronologically from 1500 to the present time, forms a valuable appendix to the work.

We do not propose to prepare an analytical review of the work; it would be difficult to do this, inasmuch as the work is not written to set forth any new views, or to advocate any particular doctrines, but to present a comprehensive exposition of our existing knowledge together with the practical conclusions most consistent with this knowledge. Our estimation of the value of the work, based on a careful examination of it, leads us to recommend it most cordially to those who wish to know what is known of the continued fevers; and it would be impossible, were it desirable, within the limits of a review, to give a digest which should serve for the reader as a substitute for a perusal of the work itself. We shall content ourselves with adverting to the author's views on a few of the important questions of which he treats.

The theory of fever which, in the author's opinion, accords with the present extent of our information, is summed up in the following propositions:—

"1. The fever-poison enters the blood.

"2. The nervous system (and particularly the sympathetic and vagus), is paralyzed.

"3. The retrograde metamorphosis of the muscles and other tissues is increased, while, at the same time, little or no fresh material is assimilated to compensate for the loss. Increased temperature, great muscular prostration, and loss of weight are the results.

"4. This destruction of tissue is increased by the accelerated action of the heart.

"5. The non-elimination of the products of tissue-metamorphosis gives rise to cerebral symptoms and local inflammation.

"6. On the elimination of the fever-poison, and of the products of tissue-metamorphosis, the nerves resume their normal functions, the undue consumption of tissue is checked, and the patient regains his strength and weight. It is impossible to say why this termination occurs at a definite time in different fevers."

Assuming that these propositions express correctly the pathology of fever, the objects of treatment are as follows :—

"1. To neutralize the poison and improve the state of the blood.

"2. To promote elimination.

"3. To reduce the temperature and the action of the heart.

"4. To sustain the vital powers by stimulating the paralyzed nervous system, and supplying nourishment to compensate in some measure for the increased consumption of tissue.

"5. To relieve distressing symptoms.

"6. To obviate and counteract local complications."

In treating successively of the three forms of continued fever, the author gives first a succinct historical account of each, next its geographical distribution, and next the etiology. He then takes up the clinical description, and introduces a few illustrative cases. An analysis of the principal symptoms comes next, followed by a consideration of the complications and sequelæ, the varieties, the diagnosis, prognosis, and mortality, the anatomical lesions and the treatment. This arrangement, it will be seen, is comprehensive, and in the several divisions just named, our existing knowledge is concisely, clearly, and fairly presented. The work bears internal evidence of the author's practical familiarity with the continued fevers, and also of his thorough acquaintance with the literature of the subject. As regards the latter, he has not overlooked the contributions of American writers. He accords to Drs. Gerhard and Pennock the credit of priority in the contribution of facts establishing the individuality of typhus.

Of the three continued fevers, the *relapsing fever* will possess comparatively little interest for the American reader. The author states that this fever is not indigenous with us. He is probably correct in this statement. Aside from five cases reported by Dr. A. Dubois as cases of typhus followed by a severe form of inflammation of the eye,[1] and fifteen cases reported by the writer of this article[2] (to which reference is made by the author), we are not aware of any reports of cases observed on this side of the Atlantic. Dr. Dubois' cases occurred in 1847–48, and our cases in 1850–51. The latter cases were all among immigrants from Ireland; but in six cases the patients had been in this country for a period varying from six months to five years. It is hardly probable that, in the latter cases, the disease was imported by the patients. In Dr. Dubois' report the facts respecting the time of residence in this country are not stated. It may be that this form of fever is occasionally produced here, but is confounded with typhus or typhoid and perhaps with remitting fever. We believe that it is not doing

[1] Trans. Am. Med. Association, vol. i., 1848.
[2] Clinical Reports on Continued Fever, p. 365.

injustice to our brethren to say that very little attention has, as yet, been given in this country, to the subject of relapsing fever, so that it would not be very remarkable if cases are not recognized as such. This was true of the cases observed by Dr. Dubois, and by us at the time the cases were under observation. It is desirable that practitioners in this country should be aware of the traits which distinguish relapsing fever, so as to be prepared to recognize examples of it should they occur, and we therefore quote the summary which the author embodies in his definition, as follows:—

"A very abrupt invasion marked by rigors or chilliness; quick, full, and often bounding pulse; white moist tongue, sometimes becoming dry and brownish; tenderness at the epigastrium; vomiting and often jaundice; enlarged liver and spleen; constipation; skin very hot and dry; no characteristic eruption; high coloured urine; severe headache, and pains in the back and limbs; restlessness and occasionally acute delirium; an abrupt cessation of all these symptoms with free perspiration about the fifth or seventh day, after a complete apyretic interval during which the patient may get up and walk about, a short relapse on the fourteenth day from the first commencement running a similar course to the first attack, and terminating on or about the third day of the relapse; sometimes a second, and even a fifth relapse; mortality small, but occasionally death from sudden syncope, or from suppression of urine and coma. After death, no specific lesion, but usually enlargement of the liver and spleen."

Whether this form of fever be a distinct species, or only a variety of the other forms of continued fever, is a question which probably all will not consider as yet positively settled. And assuming it to be a distinct species, there are certain points which require further investigation; for example, as to its contagiousness. Dr. Murchison following Dr. Jenner and others, regards it as contagious. He attributes its prevalence as an epidemic to scarcity and famine; indeed, he calls it relapsing or famine fever. Deprivation of food certainly did not enter into the causation in the cases observed by us. We cannot, however, enter into a discussion of these and other points of interest.

Typhoid fever the author proposes to call *pythogenic*, a name which denotes its supposed source to be putrescent organic matter. This title seems to us objectionable. It is based on a view of its causation which must be considered as problematical; and, certainly, the disease does not spring from a putrescent source when it is communicated by contagion. We agree with the author in his objection to the term *enteric fever*, on the ground that it conveys the erroneous impression that the fever is the result of the intestinal lesion. On the whole, the much abused name *typhoid* seems to us, in the existing state of our knowledge, to be as good as any which can be suggested, and we opine that the disease will continue to be known by this name in spite of attempts to substitute another cognomen.

Dr. Murchison holds to the non-identity of typhus and typhoid fever. He began his clinical studies with the belief in their identity, adopting the opinion of his teachers; but bed-side observation led him to the conclusion that these two forms of fever are essentially distinct, that they are two diseases, each having its own special course. Are we not at length, in view of all the facts which clinical research has developed, warranted in considering this much mooted question fully settled? Is there any occasion for protracting the discussion? We can see no other ground for the affirmative to the latter question than that a few are still unwilling to abandon views to which they are committed. If the evidence of the non-identity of typhus and typhoid fever be not complete, we are warranted in disinterring

the question as to the identity of measles and scarlet fever, which has scarcely been buried half a century. Dr. Murchison does not present any new facts bearing on the non-identity of typhus and typhoid fever, but he states the evidence justly and fairly, derived from the lesions found after death, a comparison of the phenomena during life, the existence of distinct poisons producing the two diseases etc. We commend this part of the work to those who have formed an opinion without a knowledge of all the facts bearing on this matter.

An interesting question which claims investigation is, whether the two diseases may not sometimes coexist. Dr. M. reports three cases in which they appeared to be combined. We know that the eruptive fevers may be blended, and this, we are persuaded, is true of remitting and typhoid fever. *A priori* there is no incongruity in the supposition, but further clinical observation with reference to this point is desirable.

There is no more room for doubting the occasional contagiousness of typhoid fever than its being a distinct species. The author adduces ample evidence of its communicability, but in none of the instances cited is the proof so conclusive as in the epidemic which came under our observation in 1843, an account of which was published in the *American Journal of the Medical Sciences* in July, 1845.[1] The combination of circumstances in that epidemic was so remarkable, as bearing on the question of contagiousness, that we are led here to reproduce the important facts for the sake of directing the attention of those of our readers who may be interested in this still mooted question, to the more detailed account.

A small isolated settlement known as North Boston, in the western part of New York, consisted in the autumn of 1843, of nine families and forty-three persons. The settlement embraced an inn and a group of houses within an area of ten rods. Two houses were situated at a distance of forty rods from the inn, and one of those houses was separated by a small stream. A young man from Massachusetts, travelling in the stage coach, had been ill for several days, and, at length, on the coach arriving at this settlement, was unable to proceed, and was left at the inn. Prior to this occurrence the settlement was healthy, and typhoid fever was unknown in that part of the State. The prevailing fever was intermitting and remitting. The stranger lingered twenty-nine days and died. He was seen by several physicians, and from their account of the symptoms the disease was undoubtedly typhoid fever. Twenty-three days after the arrival of the stranger, two members of the family of the inn-keeper were attacked, and subsequently five others in this family. In all the other families situated within ten rods of the inn, excepting a single family, cases occurred more or less in number, within a month from the date of the first case after the stranger arrived; and during this period more than half the population of the settlement were affected. The disease then ceased further progress, no cases afterward occurring. The disease was shown to be typhoid fever by the symptoms in several of the cases which were recorded by the bed-side, and by the characteristic intestinal lesions in the autopsy of a fatal case. The family in which no cases occurred was the only family, of the seven families residing within a few rods of the inn, the members of which were not brought into close contact with the disease. This family were on terms of non-intercourse with the inn-keeper and with the other families who were tenants and dependants of the

[1] See, also, a fuller account in Clinical Reports on continued fever by the writer of this article.

inn-keeper. None of the members of this family saw any patient affected with the disease. And in consequence of the exemption of this family and the feeling of animosity in the minds of the inn-keeper and others, it was supposed that the common well had been poisoned. This suspicion was strengthened by the fact that the family referred to had been denied access to the well, which was used in common. All these facts were ascertained by a personal investigation on the spot by the writer. The water from the well was examined by competent chemists and found to be remarkably pure. Now, in view of the facts just stated, if it be contended that the disease was not transported to this settlement and diffused by contagion, it is necessary to admit a series of coincidences almost incredible. The circumstances embrace everything which could be desired for a fair experiment in order to test the contagiousness of a disease. In fact if every circumstance had been deliberately selected and arranged for an experiment of that kind, they could hardly have been more complete.

Dr. Murchison's views of the treatment of typhus and typhoid fever seem to us, in the main, to be sound and judicious. We agree with him in thinking that there is a tendency at present to a too indiscriminate and excessive use of alcoholic stimulants. The rules which he lays down with respect to this important part of the treatment, are consistent alike with proper prudence and a due sense of its importance. He regards tea and coffee as highly useful, acting as nervous stimulants and retarding the waste of the tissues. With respect to the efficiency of the mineral acids, he does not join in the rather extravagant statements of Huss and Chambers; but, after a trial of them in many hundred cases, he believes them to be of much value. He prefers a combination of the hydrochloric and sulphuric. An injunction with respect to the administration of food is, we suspect, not less called for than judicious. It is that food should not be given at shorter intervals than two hours. We are sure that it is too often the practice in this country, as well as in Europe, to push the frequent administration of food to an extreme, leaving the patient scarcely any period for repose.

With these few references we take leave of the work as a reviewer, but not as a reader. It is a work not only to be read but often referred to. It is a great deal to say of such a work that it comprises nearly all of our existing knowledge which is of practical importance to the medical practitioner; but we believe that this may justly be said of Dr. Murchison's treatise.

A. F.

ART. XIII.—*On the Characters of Inorganic and Organic Matter.*

1. *Société Chimique de Paris. Leçons de Chimie professées en* 1860. Par MM. PASTEUR, CAHOURS, WURTZ, BERTHELOT, SAINTE-CLAIRE DEVILLE, BARRAL et DUMAS. Sujets des Leçons: *Recherches sur la Dissymétrie moléculaire des Produits organiques naturels.* Par M. L. PASTEUR; *Histoire des Radicaux organiques.* Par M. AUGUSTE CAHOURS; *Histoire générale des Glycols.* Par M. ADOLPHE WURTZ; *De la Synthèse en Chimie organique.* Par M. BERTHELOT; *Des Lois de Nombres en Chimie et de la Variation de leurs Constantes.* Par M. H. SAINTE-CLAIRE DEVILLE; *De L'Influence exercée par l'Atmosphère sur la Végétation.* Par M. J. A. BARRAL; *Deux Pièces Historiques concernant les Opinions de Lavoisier au sujet de la Formation des Êtres organisés et celles de N. Le Blanc au sujet de la Théorie des Engrais, recueillies* par M. DUMAS. Librairie de L. HACHETTE et Cie. Paris, 1861. 8vo. pp. 307.
2. *The Principles of Biology.* Part 1. *The Data of Biology.* By HERBERT SPENCER. Williams and Norgate: London, 1863. 8vo. pp. 80.
3. *The Unity of Matter. A Dialogue on the Relation between the various Forms of Matter which affect the Senses.* By ALEX. STEPHEN WILSON. Samuel Highley: London, 1855. 8vo. pp. 79.
4. *On Matter and Ether, or the Secret Laws of Physical Change.* By THOMAS RAWSON BIRKS, M.A., Rector of Kelshall, Herts; formerly Fellow of Trinity College, Cambridge. Macmillan & Co.: Cambridge and London, 1862. 8vo. pp. 216.
5. *Sur la Substance organisée et l'État d'Organisation.* Par DR. CHARLES ROBIN, Professeur d'Histologie à la Faculté de Médecine de Paris. Journal de la Physiologie de l'Homme et des Animaux. T. 5ème, Numero XX., 1èr fascicule. Victor Masson et Fils: Paris, 1862.

IF any one discovery more strongly characterizes modern science than another, it is that made by the chemist in relation to the elementary composition of natural objects. Upon the researches of Lavoisier, Thenard, Gay Lussac, Berzelius, Prout, Thompson, Saussure, Berard, Chevreul, Ure and many others, rests, in great part, one of the grandest conceptions of science—the substantive or compositional unity of creation. Everywhere in the innumerable forms of things by which we are surrounded, and the perpetually varying phenomena which they exhibit, we encounter the same material elements. These elements are eminently elective and protean. The animal differs from the vegetable, and both in turn from the mineral, the metal and the earth. These latter constitute the common matter of the globe; from this matter the former spring and to it they return again.

The natural philosopher, confounded by the number and variety of the objects presented for his consideration, has resolved to divide them, for their more convenient and efficient study, into two great classes—animate and inanimate, organic and inorganic. The classification or arrangement into kindred groups, thus inaugurated, has been still more minutely employed in each division, with the ultimate object of assigning to each body its definite position in the graduated scale of nature.

An accurate knowledge of the statical and dynamical relations existing between these two great divisions of matter, constitutes the corner stone of the stately edifice of biological science.

"In entering upon the study of Physiology," writes Müller, "the first point to be ascertained regards the distinctions between these two great classes of bodies—the organic and the inorganic—and the following questions suggest themselves for discussion: Do organic and inorganic substances differ in their material composition? and if the phenomena presented by them are obviously different, are the forces or principles on which these phenomena depend, also different; or are the forces which give rise to the phenomena of the organic kingdom merely modifications of those which produce physical and chemical actions?"[1]

Physiologists are not wanting who maintain without hesitation that such inquiries are superfluous and wholly irrelevant to the study of the complicated course of life in man and animals.[2] But the prosperity and success of biological science, as a philosophical study, obviously depend upon the determination of these very questions. Only by their determination can the relations of biology with other sciences be settled. Duges and others may ignore the discussion, but we cannot fail to perceive that the study of the differential characters of organic and inorganic bodies is, as Longet has well said, in the introduction to his elaborate "*Traité de Physiologie*"—the study of life by elimination.[3]

Now since the days of Vicq d'Azyr[4] it has been customary to distinguish organic from inorganic bodies by saying, among other things, that the former always originate from parents like themselves, grow by internal deposit, and assume, in the course of development, a rounded and constant form and a determinate size; while the latter spring from no parents, enlarge by simple accretion, and exhibit an angular and variable form and an indefinite size; that the former are heterogeneous in their composition or composed of dissimilar particles, while the latter are homogeneous or made up of particles each like the other; that the consistence of the first is characterized by softness and elasticity, of the second by hardness and solidity; that the organic body has a fixed duration of life, while the inorganic retains its individuality for an indefinite period; that the "character of an inorganic substance is to be found in the properties of its integral particles," while the "living body derives its character from the whole mass, from the assemblage of all the parts"—this character, which is more simple or complicated according to the place which the body occupies in the scale of being, differing altogether from that of its component particles." The two groups have been contrasted in point of chemical composition also. The inorganic substance is occasionally simple or elementary, is rarely composed of more than three elements, is constant in composition, can be decomposed and recomposed at will, and exhibits, when left to itself, no tendency to decomposition. The organic body, on the other hand, is said to be never simple or elementary, to consist of at least three or four elements, to be variable in composition, to be readily decomposed, but not recomposed, and to exhibit a marked tendency to decomposition.

Berzelius, Fourcroy, De Blainville, Müller and others maintained, and upon their authority the proposition was long received as true, that the binary method of combination prevails among inorganic, and the ternary or quaternary among organic bodies. Müller particularly embraced and taught this

[1] Elements of Physiology. Philada., 1843, p. 13.

[2] Duges. Physiologie Comparée. Paris, 1838, t. i. p. 4.

[3] "Étudier ces caractères, c'est entrer dans l'étude de la vie par l'élimination de ce qui n'en fait pas partie."

[4] Encyclopedie méthodique. Système anatomique. Quadrupédes par F. Vicq d'Azyr. Second discours préliminaire sur l'anatomie simple et comparée. Paris, 1792, 4to. p. iii.

view, which has since become untenable in consequence of the discovery of the radicals, and which Mulder emphatically criticized as "durchaus unchemisch," or entirely un-chemical. "If any distinction is to be made between organized and unorganized chemical substances," says this eminent chemist, "it should be stated thus: that in the former, compound radicals exist; and in the latter, elementary ones."[1]

Lewes lays down as a capital distinction between organic and inorganic substances these primary static laws :—

"I. The elements which compose organic substances are the same as those which compose inorganic substances; but in the organic they occur as higher multiples, in other words the organic molecule is a greater multiple of forces than the inorganic molecule.

"II. The presence of these higher multiples is accompanied by an indefinite composition in lieu of a definite composition, and by a characteristic immediate synthesis of the elements."[2]

For a novel and deeply interesting discourse upon a fundamental physical distinction between the organic and inorganic body, we are indebted to M. Pasteur, the distinguished French chemist, whose recent brilliant experiments in another field of scientific inquiry have resulted in giving the *coup de grâce* to the doctrine of spontaneous generation. This discourse, the title of which will be found at the head of this article, was delivered before the Chemical Society of Paris in the winter of 1860. We ask the attention of our readers to the following brief analysis of the facts and arguments contained therein.

At the close of the year 1808 Malus announced that the light reflected by all opaque or diaphanous bodies acquired new and very extraordinary properties, which distinguished it essentially from the light emitted directly from luminous objects. This modification, which light undergoes during reflection, was called by Malus polarization.

It has long been known that a direct ray of light in passing through a rhomboidal crystal of carbonate of lime is uniformly divided into two white bundles of the same intensity. The flame of a candle seen through such a rhomb is always double, and the two images are equally brilliant. Malus demonstrated that the modification impressed upon light by the double refraction was identical with that produced by reflection from the surface of opaque or diaphanous bodies; or in other words, that the ordinary and extraordinary rays produced by a doubly refracting crystal are polarized rays.

In 1811 Arago discovered that if, by the aid of a rhomboidal crystal of Iceland Spar, we analyze a polarized ray of light as it issues from a section of rock crystal cut perpendicularly to its axis, two images are constantly seen in all the positions of the rhomboid, and these two images are colored, moreover, with complementary tints.

More recently Biot polarized successively each of the simple rays of the spectrum, and found that the primitive plane of polarization was made to deviate at an angle proportional to the thickness of the section, and that this angle differs for each simple color, increasing with the refrangibility according to a definite law. Biot also made the curious observation that in some crystals of quartz the plane of polarization revolves from right to left, and

[1] The Chemistry of Vegetable and Animal Physiology. Edinburgh and London, 1849, p. 89.

[2] Comte's Philosophy of the Sciences, London, 1853, pp. 145, 152.

in others from left to right, although the crystals themselves differ apparently only by a very slight, almost imperceptible, variety in form. The rotation to the right is accomplished according to the same laws and with the same energy as that to the left.

In the Bulletin of the *Société philomatique* for December, 1815, Biot announced that the same properties were possessed by a variety of natural organic products. Oil of turpentine and an essential oil of laurel cause the plane of polarization to turn to the left, whereas, the syrup of sugar cane and an alcoholic solution of camphor turn it to the right. A compensation is effected by the superposition or mixture of two liquids which possess these opposite properties, provided no chemical action takes place. A remarkable difference was also observed by M. Biot between the action of the particles of the same substance when in a liquid or solid state. The syrup of grapes, for example, turns the plane of polarization to the left as long as it remains liquid; but as soon as it acquires the solid form of sugar, it causes the plane of polarization to revolve toward the right, a property which it retains even when again dissolved. Instances occur also in which these circumstances are reversed. A ray of light passing through a liquid possessing the power of circular polarization is not affected by mixing other fluids with the liquid—such as water, ether, alcohol, &c.—which do not possess circular polarization themselves, the angle of deviation remaining exactly the same as before the mixture. Whence M. Biot infers that the action exercised by the liquids in question does not depend upon their mass, but that it is a molecular action exercised by the ultimate particles of matter, which depend solely upon the individual constitution, and is entirely independent of the positions and mutual distances of the particles with regard to each other. These important discoveries show, that circular polarization surpasses the power of chemical analysis in giving certain and direct evidence of the similarity or difference existing in the molecular constitution of bodies, as well as of the permanency of that constitution, or of the fluctuations to which it may be liable. For example, no chemical difference has been discovered between syrup from the sugar cane and syrup from grapes. Yet the first causes the plane of polarization to revolve to the right, and the other to the left; therefore, some essential difference must exist in the nature of their ultimate molecules. The same difference is to be traced between the juices of such plants as give sugar similar to that from the cane, and those which yield sugar like that from the grape.

It is a fact established by Biot, that in circular polarization, the laws of rotation followed by the different simple rays of light are dissimilar in different substances. Whence he infers that the deviation of the simple rays from one another ought not to result from a special property of the luminous principle only, but that the proper action of the molecules must also concur in modifying the deviations of the simple rays differently in different substances.[1]

In this connection, and for the better understanding of what follows, M. Pasteur calls attention particularly to the rotatory property in tartaric acid, and its absence in paratartaric or racemic acid, which is isomeric with tartaric acid.

These physical facts being thus briefly posited, the reader is next reminded of certain mineralogical truths bearing upon this subject.

Haüy and Weiss pointed out that in quartz there exist hemihedral sur-

[1] Somerville's Connection of the Physical Sciences.

faces or planes which in some specimens incline to the right, and in others to the left. In respect to their optical properties Biot found that crystals of quartz arrange themselves into two groups, one of which turns the plane of polarized light to the right, and the other to the left. In his turn, Herschell showed that in these *plagihedral* crystals, as they are called, the direction of rotation is either to the right or left, according to the inclination of their unsymmetrical faces. In cases where no such faces can be traced, the rotative power is generally absent; and this arises, as is remarkably evident in amethyst, from the crystal being formed of separate crystals rolled up together; and as these may possess opposite rotation, and so neutralize each other, the action on light should be like that of calcareous spar, which has no rotative power.

"With such an example," writes Prof. Kane, "it was not difficult to conclude that the power of rotation depended upon the crystalline arrangement, particularly as quartz, in all its uncrystallized conditions, is devoid of all rotative power; and, accordingly, until the discovery of the power of rotation in liquids, and that this property was found to accompany the molecules of the body through all states of aggregation, it was considered to have its origin in the mechanical structure of the body; but we must now invert the argument, and infer that the difference of rotative power in right-handed and left-handed quartz does not result from the difference of crystalline arrangement, but that this last is caused by actual difference of properties in the molecules themselves, of which the most remarkable is detected by the opposite actions on light."[1]

M. Pasteur shows that all the tartrates are plagihedral, and he concludes that, as in the case of quartz, there is a correlation between hemihedry and circular polarization. Additional examples of this correlation are found among the numerous crystallizable organic products, which possess the molecular, rotatory property, and exhibit hemihedral, crystalline forms. Paratartaric acid and its salts, substances isomeric with the tartaric compounds, do not show any hemihedral tendency, and, as Biot has demonstrated, they exert no influence upon polarized light.

With these facts before him, the correspondence of hemihedry and the molecular, rotatory power of natural, organic products gradually assumed more and more importance in the mind of Pasteur. The following remarkable note of Mitscherlich, communicated to the Academy of Sciences by Biot, appeared to him to be so difficult of acceptance, as a matter-of-fact statement, that he was led to test its accuracy, or rather that of the concluding observation, by a most careful investigation into the crystallography of the tartrates and paratartrates :—

"The double tartrate and paratartrate of soda and ammonia," says Mitscherlich, "have the same chemical composition, the same crystalline form, with the same angles, the same specific gravity, the same double refraction, and consequently the same angle of optical axes. Dissolved in water their refraction is the same. But the tartrate in solution turns the plane of polarized light; the paratartrate does not. Now in these two bodies," continues Mitscherlich, "the nature and number of atoms, and their arrangement and distances are the same."

Pasteur found that the double tartrate of soda and ammonia was hemihedral, like all the other tartrates which he had previously studied, but, singularly enough, the paratartrate was equally hemihedral, with this peculiarity, that the hemihedral faces, which in the tartrate were all on the same side, inclined, in the paratartrate, sometimes to the right and sometimes to the left. Astonished at this result, he separated the right-handed

[1] Elements of Chemistry.

and left-handed crystals into two groups, and observed separately their solutions in the apparatus of polarization. He then saw that the plane of polarization was turned to the right by the right-handed hemihedral crystals, and to the left by the left-handed crystals. When equal weights of these two salts were dissolved together the mixture was neutral for light, in consequence of the two deviations being equal and on opposite sides.

Pasteur's investigations upon the double paratartrate of soda and ammonia show that there are two symmetrically, isomorphous, atomical groups intimately united in paratartaric acid. From a solution of the double paratartrate, crystals are deposited which have exactly the same angles, the same aspect, &c., to such a degree that M. Mitscherlich, after the most minute study of their form, could point out no difference between them. Nevertheless they affect a ray of polarized light differently, and it is easy to prove that these two species of crystals represent two distinct groups from which we can obtain two distinct acids. The one which is derived from the right hemihedral salt turns the plane of polarization to the right, and is identical with the ordinary tartaric acid. The other, like the salt which furnishes it, turns the ray to the left. Relatively to their chemical and crystallographic properties, all that can be done with one of the acids may be repeated with the other under the same conditions; and in both cases we obtain products identical but not superposable, products which resemble each other as the right hand does the left. They exhibit the same forms, the same surfaces, the same angles, and are hemihedral in both cases. The only difference is in the inclination of the hemihedral facettes, and in the direction of the rotatory power.

Let us recall here the definition of a chemical species as laid down by Chevreul in 1823: "*Dans les corps composés,*" said he, "*l'espèce est une collection d'êtres identiques par la nature, la proportion et l'arrangement des éléments.*" All the properties of bodies are functions of these three terms, and the object of the philosophical chemist is to arrive at an acquaintance with these three physical characters, through our knowledge of properties.

The study of isomerism and isomorphism enables us to establish a connection between the chemical and physical properties of bodies on the one hand, and the molecular arrangement which determines these, on the other. In other words, we are thus enabled to ascend from the properties of bodies to their ultimate atomic cause.

From studies of this nature Pasteur concludes that, 1st, when the elementary atoms of organic products are grouped unsymmetrically, the crystalline form of the body manifests this molecular dissymmetry by non-superposable hemihedry. Here then we may detect the cause of the hemihedral character of certain crystals. 2d. The existence of this same molecular symmetry shows itself by rotatory, optical properties. The cause of rotatory polarization thus becomes manifest.

If we attentively consider all material objects, whatever they may be in respect to their forms, and the repetition of their identical parts, we find that they are divisible into two great classes—those with superposable and those with non-superposable images. All the artificial products of the laboratory and all mineral bodies have superposable images. On the contrary most of the natural, organic products, and all the essential products of life are unsymmetrical, and this want of symmetry prevents their image from being superposable.

In order to elucidate this difference Pasteur thus compares together the

structure of quartz and that of natural organic products. Imagine, he says, a winding staircase, the steps of which are cubes or any other object with superposable image. Destroy the staircase and the dissymmetry will have disappeared, inasmuch as the want of symmetry of the staircase was merely the result of the manner in which the steps were arranged. Such is quartz. The crystal of quartz is the staircase all entire. It is hemihedral, and, in consequence, influences polarized light. If we dissolve the crystal or destroy its physical structure in any manner whatever, its non-symmetrical character is suppressed, and with it all action on polarized light. Imagine, on the contrary, the same winding staircase composed of irregular tetrahedra for steps. Destroy the staircase and the non-symmetry still remains, because each component tetrahedra is a non-symmetrical body proper, no matter in what position it is placed. Such are the organic bodies where all the molecules have a dissymmetry peculiar to themselves and expressing itself in the form of the crystal. When the crystal is dissolved the liquid still influences polarized light, because it is formed of molecules, mixed together confusedly, it is true, but each one being non-symmetrical in the same direction, if not to the same extent.

Quartz is therefore not molecularly dissymmetrical, nor have we any example of a mineral possessed of molecular dissymmetry. This statement is true also of the artificial compounds of the laboratory.

All the substances most essential in the animal and vegetable organisms, such as cellulose, fecula, gum, sugar, tartaric, malic, quinic and tannic acids, morphia, codeia, quinia, strychnia, brucia, albumen, fibrin, gelatine, &c., are molecularly dissymmetrical. They have the power of rotating light, a feature necessary and of itself sufficient to establish asymmetry in the absence of the hemihedral character.

A body may possess right-handed or left-handed dissymmetry. In consequence of certain peculiarities of isomeric transformation, which it is necessary to discover for each case, it may lose its molecular dissymmetry, untwist itself, so to speak, and effect in the arrangement of its atoms a symmetrical form. By the action of heat a right-handed body may be turned into a left, and inversely. Thus by heating right tartaric acid it is transformed into left tartaric acid, or rather paratartaric acid. Molecular dissymmetry powerfully modifies chemical affinity and influences the characteristic properties of bodies.

Pasteur thinks that a dissymmetrical force is present and in action at the moment of the elaboration of the immediate principles in the vegetable organism.

> "I regard," he writes, "as a necessary conclusion the existence of dissymmetrical forces at the moment of the elaboration of natural organic products—forces which are absent or without effect in the reactions of our laboratories, either on account of the abrupt action of these phenomena, or from some unknown circumstance."

Whether these forces reside in light, electricity, magnetism or heat; whether they are related to the motion of the earth, or to the electrical currents by which physicists explain the terrestrial magnetic poles, he thinks it impossible to offer at present any conjecture.

The researches of Pasteur show that molecular dissymmetry modifies the active phenomena of life as well as the chemical affinity exhibited by inorganic matter. Of this we have an interesting proof in the phenomena of fermentation. If we dissolve some right-handed crystals of the pure tartrate of ammonia and add to the solution a small quantity of some albu-

minoid substance, in the proportion of 1 grain of the dried albuminoid matter to 100 grains of the tartrate, and place the mixture in an oven, fermentation will take place spontaneously. If we treat the paratartrate of ammonia in the same manner, it also ferments. If, however, we observe the two processes, by means of the apparatus of polarization, we soon discover profound differences between them. The liquid, originally inactive, acquires a rotatory power to the left, which augments by degrees and attains a maximum, when the fermentation is suspended. There is no longer a trace of the right acid in the liquid, which, evaporated and mixed with its volume of alcohol, furnishes immediately a beautiful crystallization of left-handed tartrate of ammonia.

In this phenomenon, as in all cases of fermentation properly so called, there is a substance chemically transformed, and at the same time the ferment itself is increased in quantity. In this particular case, however, and this is worthy of note, the ferment which actively influences the right handed salt, respects the left, notwithstanding that the two salts, as long as they are not submitted to dissymmetrical actions, are absolutely identical in chemical and physical properties.

Here, then, we see the molecular dissymmetry peculiar to organic matters, intervening in a physiological phenomenon, in such a marked manner as to demand for its influence in all our biological studies, the most attentive consideration, especially as it claims to constitute the only trenchant line of demarcation between the chemistry of inanimate and that of living nature.

Upon some of these physical and chemical distinctions, various scholastic definitions of organized and inorganic bodies have been based and published from time to time, as exact interpretations of nature's method. But neither these distinctions nor the apparently reliable formulæ growing out of them, are able to stand the test of rigid examination.[1]

[1] Such formulæ require modification from time to time, as new views of the intimate nature of matter arise. Thus in 1849, Dr. Chas. Robin attempted a definition of organized beings in the following language:—

"Corps de volume et de forme déterminés, quoique très divers, limités par des surfaces courbes ; présentant un ensemble de caractères physiques qui résultent de la disposition des éléments anatomiques dont ils sont formés, et qui, bien que variables de l'un à l'autre, n'appartiennent pourtant qu'à eux ; composés de principes immédiats gazeux, liquides et solides, dus à des combinaisons complexes et peu stables d'un petit nombre de substances simples."—*De la classification des Sciences fondamentales en général, de la Biologie et de l'Anatomie en particulier.* Paris, 1849, p. 117.

In the October number (1862) of Dr. Brown-Séquard's *Journal de la Physiologie*, which has just reached us, we find a highly philosophical memoir upon "Organized Substances," contributed by Dr. Robin. In this memoir the following paragraph occurs:—

"Un *corps organisé* est ; tout corps solide, demi-solide ou liquide provenant d'un être qui a ou qui a eu éxistence séparée, composé de principes immédiats nombreux et complexes, appartenant à trois groupes ou classes distincts, et unis molécule à molécule par dissolution réciproque et combinaison spéciale. Que ce corps forme un tout indépendant ou une partie d'un tout, ce n'est pas moins un *corps organisé*, et l'être complexe d'ou proviennent les parties est, à plus forte raison, un *corps organisé*."

The first definition, it will be observed, involves the fundamental idea of the attribution of the characteristic properties of organized bodies to a peculiar arrangement of their constituent anatomical elements. In the second the essential feature is the union of the immediate principles molecule by molecule.

A steadily progressive chemical science is day after day more and more positively showing us that the difference manifested to the unaided senses by the various natural bodies constituting the universe, is a difference of degree rather than of kind, of combination rather than of diversity. In organized matter no element is found which does not exist in the inorganic world, and if we are to accept the theories of combination advanced by Graham and Daniell—theories based upon certain electrical decompositions—even the methods of combination in the two kingdoms are perfectly analogous.

The distinctions in truth, between the organic and inorganic worlds, as ordinarily laid down by physiologists, are more specious than real. Such distinctions, like many of those recognized by naturalists in their systematic classifications, result rather from the refining and subtilizing tendencies of the human mind, than from any inherent differences in nature.

Between the organic and inorganic body there are undoubtedly dynamic differences. But these differences, the conditions being the same, necessarily presuppose others of a statical character. As the very first step, therefore, towards determining the nature and extent of such differences, and estimating their true value in biological science, we must acquaint ourselves with all the details of the dynamical and statical characters of organic matter. Those of inorganic matter have been quite fully, though not entirely, ascertained.

In the first chapter of his *Principles of Biology*, Herbert Spencer, with a highly philosophical conception of the nature of his subject, addresses himself to the discussion, not of the points in which organic and inorganic bodies differ, but of the characteristic features of organic matter. These features are briefly as follows:—

Organic bodies are made up chiefly of the four essential elements, oxygen, hydrogen, nitrogen and carbon, three of which are gaseous, are known in the aeriform state only, and have hitherto defied all attempts to reduce them to the liquid condition, even under the greatest pressures.

"Considering them chemically instead of physically, it is to be remarked that three out of these four main components of organic matter, have affinities which are narrow in their range and low in their intensity. * * * * * *

"Among the organic elements, including under the title not only the four chief ones, but also the less conspicuous remainder, that capability of assuming different states called allotropism, is frequent. * * * *

"Allotropism being interpretable as some change of molecular arrangement, this frequency of its occurrence among the components of organic matter, is significant as implying a further kind of molecular mobility.

"One more fact, that is here of great interest for us, must be set down. These four elements of which organisms are almost wholly composed, present us with certain extreme antitheses. While between two of them we have an unsurpassed contrast in chemical activity, between one of them and the other three, we have an unsurpassed contrast in molecular mobility. While carbon, by successfully resisting fusion and volatilization at the highest temperatures that can be produced, shows us a degree of atomic cohesion greater than that of any other known element; hydrogen, oxygen and nitrogen show the least atomic cohesion of all elements. And while oxygen displays, alike in the range and intensity of its affinities, a chemical energy exceeding that of any other substance (unless fluorine be considered an exception), nitrogen displays the greatest chemical inactivity. Now, on calling to mind one of the general truths arrived at when analyzing the process of evolution, the probable significance of this double difference will be seen. It was shown (*First Principles*, § 123) that, other things equal, unlike units are more easily separated by incident forces than like units are; that an incident force falling on units that are but little dissimi-

lar does not readily segregate them; but that it readily segregates them if they are widely dissimilar. Thus, these two extreme contrasts, the one between physical mobilities, and the other between chemical activities, fulfil, in the highest degree, a certain further condition to facility of differentiation and integration.

"Among the binary combination of these four chief organic elements, we find a molecular mobility much less than that of these elements themselves; at the same time that it is much greater than that of binary compounds in general. * *

"Considering them chemically it is to be remarked of these binary compounds of the four chief organic elements, that they are, on the average, less stable than binary compounds in general. Water, carbonic oxide, and carbonic acid, are, it is true, difficult to decompose. But omitting these, the usual strength of union among the elements of the above named substances is low considering the simplicity of the substances. * * * * * *

"Here it will be well to note, as having a bearing upon what is to follow, how characteristic of most nitrogenous compounds is this special instability. In all the familiar cases of sudden and violent decomposition, the change is due to the presence of nitrogen. * * * * * * When we come hereafter to observe the part which nitrogen plays in organic actions, we shall see the significance of this extreme readiness shown by its compounds to undergo change. * * * *

"These binary compounds, like their elements, are to a considerable degree characterized by the prevalence among them of allotropism; or, as it is more usually called when displayed by compound bodies, isomerism.

"There is one further fact respecting these binary compounds of the four chief organic elements, which must not be overlooked. Those of them which form parts of the living tissues of plants and animals (excluding water, which has a mechanical function, and carbonic acid, which is a product of decomposition) are confined to one group—the hydro-carbons. And of this group, which is on the average characterized by comparative instability and inertness, these hydro-carbons found in living tissues, are among the most unstable and inert.

"Passing now to the substances which contain three of these chief organic elements, we have first to note that along with the greater atomic weight which mostly accompanies their increased complexity, there is, on the average, a further marked decrease of molecular mobility.

"In chemical stability these ternary compounds, considered as a group, are in a marked degree below the binary ones. As a class they are chemically inactive and the phenomena of isomerism and polymerism are of frequent occurrence among them. * * * * *

"It is, however, the nitrogenous constituents of living tissues that display most markedly those characteristics of which we have been tracing the growth. Albumen, fibrin, casein, and their allies, are bodies in which that molecular mobility exhibited by three of their components in so high a degree, is reduced to a minimum. The chemical characteristics of these substances are instability and inertness carried to the extreme. * * *

"It should be noted, too, of these bodies that, though they exhibit in the lowest degree that kind of molecular mobility which implies facile vibration of the atoms as wholes, they exhibit in a high degree that kind of molecular mobility resulting in isomerism, which implies permanent changes in the positions of adjacent atoms with respect to each other. Each of them has a soluble and insoluble form. In some cases there are indications of more than two such forms. And it appears that their metamorphoses take place under very slight changes of conditions.

"In these most unstable and inert organic compounds, we find that the atomic complexity reaches a maximum; not only since the four chief organic elements are here united with small proportions of sulphur and phosphorus, but also since they are united in high multiples. The peculiarity which we found characterized even binary compounds of the organic elements, that their atoms are formed not of single equivalents of each component, but of two, three, four, and more equivalents, is carried to the greatest extreme in those compounds that take the leading part in organic actions. * * * * *

"Applying to atoms the mechanical law which holds of masses, that since

inertia and gravity increase as the cubes of the dimension while cohesion increases as their squares, the self-sustaining power of a body becomes relatively smaller as its bulk becomes greater; it might be argued that these large aggregate atoms which constitute organic substance are mechanically weak — are less able than simpler atoms to bear, without alteration, the forces falling on them. That very massiveness which renders them less mobile, enables the physical forces acting on them more readily to change the relative positions of their component atoms, and so to produce what we know as re-arrangements and decompositions. * * * *

"Professor Graham has recently published a series of important researches, which promise to throw much light on the constitution and changes of organic matter. He shows that solid substances exist under two forms of aggregation —the colloid or jelly-like, and the crystalloid or crystal-like. The colloid is a dynamical state of matter, the crystalloidal being the statical condition. The colloid possesses *energia*. It may be looked upon as the primary source of the force appearing in the phenomena of vitality. To the gradual manner in which colloidal changes take place (for they always demand time as an element), may the characteristic protraction of chemico-organic changes also be referred.

"The class of colloids includes not only all those most complex nitrogenous compounds characteristic of organic tissue, and sundry of the oxyhydro-carbons found along with them; but significantly enough, it includes several of those substances classed as inorganic, which enter into organized structures. * *

"A portion of organic matter in a state to exhibit those phenomena which the biologist deals with, is, however, something far more complex than the separate organic matters we have been studying; since a portion of organic matter in its integrity, contains several of these.

"In the first place, no one of those colloids which make up the mass of a living body, appears capable of carrying on vital changes by itself: it is always associated with other colloids. A portion of animal-tissue, however minute, almost always contains more than one form of protein-substance: different chemical modifications of albumen and gelatine are present together, as well as, probably, a soluble and insoluble modification of each; and there is usually more or less of fatty matter. In a single vegetal cell, the minute quantity of nitrogenous colloid present, is imbedded in colloids of the non-nitrogenous class. The microscope makes it at once manifest, that even the smallest and simplest organic forms are not absolutely homogeneous.

"Further, we have to contemplate organic tissue, formed of mingled colloids in both soluble and insoluble states, as permeated throughout by crystalloids. Some of these crystalloids, as oxygen,[1] water, and perhaps certain salts, are agents of decomposition; some, as the saccharine and fatty matters, are probably materials for decomposition; and some, as carbonic acid, water, urea, kreatine, and kreatinine, are products of decomposition. Into the mass of mingled colloids, mostly insoluble and where soluble of very low molecular mobility or diffusive power, we have constantly passing, crystalloids of high molecular mobility or diffusive power, that are capable of decomposing these complex colloids; and from these complex colloids, so decomposed, there result other crystalloids (the two chief ones extremely simple and mobile, and the rest comparatively so) which diffuse away as rapidly as they are formed.

"And now we may clearly see the necessity for that peculiar composition which we find in organic matter. On the one hand, were it not for the extreme molecular mobility possessed by three of its chief elements out of the four; and were it not for the consequently high molecular mobility of their simpler compounds; there could not be this quick escape of the waste products of organic action; and there could not be that continuously active change of matter which vitality implies. On the other hand, were it not for the union of these extremely

[1] It will perhaps seem strange to class oxygen as a crystalloid. But inasmuch as the crystalloids are distinguished from the colloids by their atomic simplicity, and inasmuch as sundry gases are reducible to a crystalline state, we are justified in so classing it.

mobile elements into immensely complex compounds, having relatively vast atoms that are made comparatively immobile by their inertia, there could not result that mechanical fixity which prevents the components of living tissue from diffusing away along with the effete matters produced by the decomposition of tissue."

In view of the difficulties encountered in the differential comparison of organic and inorganic bodies, Lewes proposes the following theory, the mere suggestion of which shows how little reliable are the scholastic definitions which have been indulged in since the days of Vicq d'Azyr.

After announcing the static laws of organized substances, already referred to, he says:—

"Matter may be considered under three aspects: 1st. Non organized; 2d. Organizable, or partly organized; 3d. Organized. For these three conditions I propose the names of Anorganic, Merorganic, and Teleorganic.

"I. Anorganic matter is that usually termed inorganic—water, salts, minerals, &c.

"II. Merorganic matter is matter in an intermediate state, wherein it either wants some addition to become organized, or else (as in organic products), has lost some of the elements it had when organized. Thus, the blastema from which cells are formed is the highest condition of merorganic matter—it is just on the eve of becoming vital. So also the cells which have lost their vitality in the very fulfilment of their function are all merorganic.

"III. Teleorganic matter is matter in that condition in which the cell, fully equipped, can and does perform its function.

"From this classification it appears that the passage from the inorganic to the organic does not take place directly; but the anorganic passes into the merorganic, and the merorganic into the organic. What is the indispensable condition of this final passage? What is it which makes the merorganic substance vital? What is the form which being universal may be supposed indispensable to organic life? Half the prosperity of philosophy lies in being able to put a definite question. Interrogate Nature and she will answer. She answers in this case emphatically—*a cell.*

"*Merorganic substances become teleorganic by the assumption of a spherical form.*

"Thus, then, the passage from the inorganic to the organic is a triple process of differentiation. 1. Of Elements; 2. Of Synthesis; 3. Of Form; and the union of 'higher multiples' (in certain determinate conditions named 'proximate principles') with 'Spherical Form,' is the final step which determines vitality."[1]

The passages just quoted are well worthy our attentive consideration. They clearly set forth the gradual nature of the transition of matter from the inorganic to the organic state, and show what little reliance can be placed upon the compositional distinctions which have from time to time been employed as a basis for classification. We must object, however, to the use of the word "spherical" instead of cellular, and still more to the logic which conducts us to the conclusion enunciated above in the italicized sentence.

It is well known that the vapour of water in condensing into snow or hail not unfrequently takes a spherical form. Boutigny, in his experiments upon the spheroidal condition of bodies, has shown that water projected upon a hot metallic plate instantly assumes a spheroidal form, an internal motion of its particles being observed at the same time. If iodine, which is a volatile element, be thrown into a red-hot capsule, it is at once transformed into a spheroid. Potash rapidly combines with iodine, but if a piece of this alkali is thrown upon it in the capsule, it also takes the sphe-

[1] Op. cit., pp. 152, 153, 157, 161.

roidal form, and both bodies revolve independently of each other, their chemical affinities being entirely suspended; but allow the capsule to cool, and they combine immediately.[1]

Here, then, we witness inorganic matter suddenly becoming spheroidal without becoming organic, and exhibiting great motorial activity together with a remarkable suspension of chemical affinity. With such facts before us, we are compelled to regard the language of the above static law as inaccurate. Mr. Lewes undoubtedly meant to say that merorganic substances become teleorganic by the assumption of a *cellular* form.

But is the idea expressed by this law true in point of fact? Let us follow its able and enthusiastic expositor in his comments upon it. He considers the blastema or nutrient fluid, made up as it is of the higher multiples and the proximate principles of indefinite composition, as organizable but not vital; and the only known and decisive condition which can transform this blastema into a vital substance is simply the assumption of a spherical form. This form is the last step in the process, and by the loss of it the cell loses its peculiar vital characteristic—its reproductive power.

"I have been asked," he writes, "and shall be asked again, 'Whence this spherical form? What is the cause which determines these higher multiples to assume the spherical form?' I do not know. The question is one which no positive philosopher will ask, recognizing as he does the impossibility of our ever knowing *causes*. He endeavours to trace the 'relation of existence and succession,' and is content if he succeed. In the foregoing pages I have endeavoured to trace the statical conditions which characterize organic substances. If they are accurately traced, you have no more right to ask me *what causes* the protein compounds to become spheroid than you have to ask what causes a saline solution to assume a rhomboidal solidity and become crystal. These are ultimate facts—the hieroglyphs no priest can read."[2]

We have long considered it a radical defect in the positive philosophy of August Comte, so ably advocated by Mr. Lewes, that it concentrates attention upon the purely phenomenal to the exclusion of all reference to scientific causation. It deals too much with results and too little with the hidden springs of action. It observes phenomena, records the order of their succession, and is content with finding the cause of each phenomenon in some immediately antecedent event. It is convinced that abstract secondary causation does not exist, and that the search after essential causes is vain; that beyond rational empiricism there is for science nothing but illusion and hypothesis; that the physiologist must limit himself to describe the functions of the organism without pretending to seize the proximate cause of these functions; and dogmatically asserts, *de haut en bas*, that the attempt to solve such problems has been discarded from the list of legitimate objects for scientific inquiry.

In such dicta we can discover no sympathy with the grand and truly philosophical efforts made at various times to reduce the multitudinous and complicated phenomena of biology to the fewest and simplest expressions or laws which are capable of explaining them, and thereby satisfying the earnest and inspired longings which the human mind has ever exhibited and ever will exhibit to become acquainted with the *causæ rerum*.

[1] Sur les phénomènes que présentent les corps projetés sur des surfaces chaudes. Annales de Chimie et de Physique, t. xi. p. 16. See also Comptes Rendus, 6 Mars, 1848, and Hunt's Poetry of Science, or Studies of the Physical Phenomena of Nature, Boston, 1850.

[2] Op. cit., pp. 158, 159.

To consider every fact, the cause of which is not evident upon the slightest reflection, as ultimate and inexplicable, is to class ourselves with those who, in the quaint language of Bishop Berkely, "are accustomed rather to compute than to think; earnest rather to go on fast and far than solicitous to set out warily and see their way distinctly."

With a more hopeful conviction of the capabilities of the human mind, and a profounder trust in the simplicity and harmony of nature, let us rather say, with the illustrious author of the *Novum Organon:* "If any one think that the secrets of nature remain shut up, as it were, with the seal of God, and by some mandate interdicted to human wisdom, we shall address ourselves to remove this weak and jealous notion; and, relying on simple truth, shall bring the inquiry to this issue, not only to silence the howl of superstition, but to draw religion herself to our side."

Entertaining such views, we feel it incumbent upon us not to be satisfied with the statement that the organizable blastema becomes vital by the assumption of a spheroidal form. With great propriety we may ask, indeed, if this statement be true. Does globular or cellular *form* give vital activity to the plastic, albuminous fluid? Or, rather, is not this form at once the manifestation and result of the vital activity of the blastema? Does not the process of cytogenesis indicate the presence of some force or agent, correlated it may be with the physical forces or imponderables, so called, by which the atoms of the blastema are aggregated together so as to form a globular body? And if this be so, should we not, as earnest seekers after truth, instead of regarding form and composition as the impenetrable veil of Isis, go behind form and composition, and grapple with those ultimate facts of whose activity form in the concrete is the visible manifestation?

The cell is the primary and simplest form of organized matter. From it are derived all the tissues and organs, whether simple or compound, that make up the entire vegetable and animal fabric. The interesting processes of development, growth, nutrition, and decay, are but the visible expressions of the activity of this self-multiplying and self-metamorphosing cell. Constituting the unity of animated nature, the *punctum saliens* of all the conditions of organization, the philosophic mind beholds in it the neutral ground upon which all the misleading distinctions between animality and vegetality are obliterated and the distinctions of species in nature shown to be fallacious.

Thus, then, this peculiar collocation of inorganic elements specially endowed, and constituting, as it were, the first decided morphological remove from the inorganic world, presents itself for our consideration with claims of the highest character. Its origin, chemical composition, physical structure, term of existence and decay, and all its properties, whether chemical, physical, or vital, are each separately deserving of the most careful and elaborate study.

And, first, the form of the cell especially merits our attention, since to it all organized forms are directly or indirectly related; to its variations all the motorial phenomena of the organism are directly or proximately due; and, lastly, because its study distinctly involves the consideration of the modes of action of the formative force—the principle or agent which alone possesses the property or power of "evolving forms out of formless matter."

Natural orders, classes, families, genera and species when carefully and

philosophically analyzed, are found to depend for their existence upon certain typical laws of formation, a knowledge of which is obtained only by accurately comparing together the common morphological periods presented by all animals in the process of their development from the simple cell to a positive and determinate specific expression. Development is formation, and formation as an act or process implies form as its determinate result, always the same under like conditions. Form in the hands of both the naturalist and the physicist is a valuable guide. Buffon tells us that "that which is most constant, most unchangeable in nature is the impress or mould of each species, both in animals and in plants; that which is most variable and corruptible is the substance of which they are composed." So also Cuvier writes—"the form of bodies is more essential to them than the material, since this latter changes unceasingly, while the other is maintained."

"That which constitutes the *being* of a living body," says Flourens, "and, consequently, its identity, its sameness, is precisely what does not change; that is its form, its force, that force of which the material is only the depository: that which changes is precisely that which is not itself, that is the material." And again, "in everything which has life the form is more persistent than the material."

"But the phenomena which most unquestionably characterize organic nature," writes Prof. Jackson, "are the perpetual production of special organic matter, and repetitions in successive generations of the same typical forms, infinite in number and variety, expressed in the organization of living beings. Organic forms proceed from formless plastic matter now as at the beginning. But the most striking and familiar feature distinguishing organic forms, at once mysterious and undefinable, is the permanency of the created *form*, while the *material* expressing that form is the most unstable and transitory of substances."

The more we push our inquiries into the domain of natural phenomena the more forcibly are we led to the recognition of the importance of form and composition. Form as an entity cannot exist independently of a material substratum—a formative or plastic material. The mathematical accuracy with which the particles of matter move in the assumption of form implies the active presence of a motorial principle or molecular force. Form, composition and a moving principle are the three elements presented for study in the crystal and the organic cell.

Dr. Carl Schmidt asks and settles for himself this pertinent question. "Does an analogous combination of the chemical go hand in hand with the homonymous development of the morphological elements or not? In other words is there any connection between the elementary constitution of matter and its external, mathematically definable, and appropriate limitation in space?"[1] An extensive and scrutinizing chemical investigation enables him to answer this question in the affirmative, thus experimentally confirming in great measure the famous law laid down by Reil in his "*Archives*," that "the phenomena of individual life are the necessary result of form and composition;" confirming too the generalization of Mulder, that "by matter and form, by form and matter, all that we observe in nature is to a great extent determined. This general conclusion is drawn from the innumerable phenomena we perceive in the organic world—phenomena which differ whether, on the one hand, the materials are the same and the forms differ

[1] Contributions to the Comparative Physiology of the Invertebrate Animals, being a Physiologico-Chemical Investigation. Scientific Memoirs. Vol. v. part 17, p. 1.

or, on the other, the materials differ, while the forms are the same." But form, philosophically considered, is only the individuation of matter, the mode in which matter assumes a certain specific identity or characteristic individuality of expression. There are many facts which tend to the conclusion that ponderable matter is, of itself, powerless to move and therefore to assume forms. Hence we must regard form and composition as the proximate cause, or rather antecedent condition through which natural phenomena are manifested.

In another place we have been at considerable pains to collect together numerous and striking facts which throw much light upon the cause of the forms of inorganic bodies.[1] My space permits me to allude to a few only of the conclusions there arrived at, and which have an immediate bearing upon the subject in question. Thus it appears that between the form and ponderable atomic constitution of a body no invariable connection can be made out; that the forms of crystals are immediately dependent upon peculiar axial proportions, which are themselves the results of a certain molecular arrangement; that molecular arrangement and disarrangement presupposes a motor agent; while the definite and constant relation between changes in aggregation and variations in form, implies the materiality of this agent and its continued presence whether in the same or varying quantities; that this agent has periods of action and periods of rest; that caloric is a positive material entity—an essential element in all bodies, always present in varying proportions; that caloric is self-repellent and endowed with great physical power; that crystalline form is the visible representative of atomic volume; that isomorphous bodies have sensibly the same atomic heat and the same volume; that in elementary and compound isomorphous groups, the numbers indicating atomic heat and volume are simply related; that at certain temperatures the elements may all be made to assume the same form; that variation in the atomic heat of a body is accompanied by variation in its form; that atomic heat is the cause of isomorphism and polymorphism, consequently of crystalline form in general.

From all this it would appear that in the act of crystallization we must recognize a peculiar force or agent which aggregates particles and gives to them, not only form, but probably also all those so-called properties which constitute the specific and characteristic attributes of the body, which makes gold, gold, and iron, iron, &c. Just as "in the simple act of cytogenesis we recognize a force in operation which converts certain chemical compounds into a living organized structure, not only moulding them into a peculiar and characteristic form, but endowing them with new attributes.[2]

The varied and interesting transformations which constitute the cytogenetic process are in fact but the prototype in miniature of the development of the entire vegetable or animal organism from which the cell originally sprung. At first sight these phenomena appear to be totally different from those presented by the so-called inanimate world. But a closer inspection shows that some at least of them are fairly attributable to the action of chemical and physical laws, and the progress of discovery tends more and more to bring them all within the category of physico-chemical science, or, in other words, to show that physiology is neither more nor less than the

[1] Essay on the Relation of Atomic Heat to Crystalline Forms. Journal of the Academy of Natural Sciences, vol. iii. p. 105.

[2] Carpenter, Principles of Human Physiology, Philada., 1853, p. 129.

physics of the organism.[1] Cell-formation itself appears to be regarded by Schleiden as simply a chemical act.[2]

In 1807, Dr. Thomas Young, in his *Lectures on Natural Philosophy and the Mechanical Arts*, and in 1824, M. Biot, in his *Précis Elémentaire de Physique*, recognized and announced as a fundamental principle of the inorganic world, that solidification is a process identical with crystallization. The proofs of this proposition are so abundant that it is now generally accepted by physicists.

The limitation of this identity to solidification as it occurs in inorganic matter, appears to us, however, to be entirely too restricted a method of viewing the comprehensive and intimately connected operations of nature. The significance of this remark will be perceived when we reflect how utterly impossible it is to draw a positive line of demarcation between organic and inorganic matter, the transition from the one to the other being so gradual, that none can say here one begins and the other ends.

"We cannot indeed," very philosophically writes Dr. Kirkes, "draw an absolute rule of chemical distinction between the two classes (of organic and inorganic matter), for there are substances which present every gradation of composition between those that are quite organic and those that are inorganic. Such substances of intermediate composition are many that are formed when inorganic matters, taken as nutriment by plants, gradually assume the characters of organic matter, under the influence of the vital properties of the plant; and such are those which are found in both plants and animals, when, out of the well organized tissues, or out of the sap or blood, materials are being separated, to form either tissues for mechanical service, or stores for nutriment, or purifying excretions. In both cases, the substances that are in the state of transition between the organic and the inorganic, or between the more and the less organized states, may proceed through changes so gradual that no natural line of

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[1] "The time will come, and is no longer distant, when the entire physiology of animal life will be resolved into physiological physics and physiological chemistry."—Prof. C. G. Lehman, *Manual of Chemical Physiology*, Amer. ed., p. 54.

"The ultimate laws or principles of physiology are the ultimate laws or principles of chemistry and natural philosophy."—Lardner Vanuxem. *An Essay on the Ultimate Principles of Chemistry, Natural Philosophy and Physiology*, deduced from the distribution of matter into two classes or kinds. Part 1. Philada. 1827, p. 84.

"The more our knowledge of these two departments (living and dead matter) is extended, and the nearer the several parts of the great science of nature are seen to approximate, the more firmly must we embrace the idea, as necessarily conformable to truth, that the same forces govern alike the animate and inanimate kingdoms."—Mulder, *op. cit.*, p. 2.

"The philosophers of the last century thought that the vital principle was antagonistic to inorganic laws, and by suspending their actions, maintained the body in life and health; but it has been reserved for the present generation to show that the same laws of physical force which are indissolubly linked and correlated in the inorganic world are also the mainspring of the wonderful actional properties of life, and that from chemical and destructive changes the source of the mechanical powers of animated beings is obtained, and which force or energy is never destroyed or obliterated—all organic nature being, equally with inorganic, subjected to one universal conservation of force."—*Annual of Scientific Discovery for* 1863, p. 189.

[2] "If we regard the easy transformation of the assimilated matters, and may from artificially conducted experiments draw the conclusion that the nitrogenous matter which I have called mucus, and which forms the cytoblast, is the substance which calls forth these transformations, and if we farther remark that sugar and dextrin are more easily soluble than jelly, and that sugar and gum are changed into jelly if the quantity of water is not increased, and which must be necessarily precipitated, we must regard the whole process of cell-formation as simply a chemical act."—*Principles of Scientific Botany*, p. 35.

demarcation between the two states can be discerned; and one cannot say when that which has been called inorganic has acquired the characters of an organic body, or when that which has been organic ceases to deserve the name. Alcohol, ether, acetic acid, urea, uric acid, and the fatty and oily matters, are such substances of organic origin, and intimately related to such as no one would hesitate to call organic, yet in their simplicity and mode of composition they are like inorganic matters."[1]

In view of these facts concerning the unity of organic and inorganic matter we are constrained to regard all solidification as essentially the same.

"If then," says Prof. Dana, "crystallization and solidification are properly one and the same process, the laws that govern in crystallization are the laws of cohesive attraction. The science of crystals instead of treating only of certain singular polyhedral forms assumed by minerals, is the study of the fundamental agency by which inorganic matter is governed in its aggregations."[2]

Similarly the study of the development of animals and plants is the study of the aggregation of organic atoms and their assumption of specific forms. The science of physiology is, therefore, simply the study of the fundamental agency by which such atoms are aggregated and governed in their movements of formation and deformation, composition and decomposition. But if solidification be virtually the same process wherever it occurs, and if crystallization is identical with solidification, or, as Dr. Young expresses it, "is the universal cause of solidity," then it follows that from the laws of crystallization we may learn much concerning the laws of organic formation, as these latter are manifested in the processes of reproduction, growth, and development.[3] Now, it is very evident that these so-called laws of crystallization are merely the generalized expressions of the particular motorial changes which the atoms of ponderable matter undergo in their transition towards a fixed and determinate form.

The characteristic tendency of organic matter is, as we have already

[1] Manual of Physiology, 2d Amer. ed., p. 27.

[2] On Certain Laws of Cohesive Attraction. By Jas. D. Dana. Amer. Journ. Sci., 2d ser., Nov. 1847.

[3] Some of the more prominent of these laws of crystallization, as laid down by Prof. Dana in the article already quoted, may be advantageously referred to here.

1. The different kinds of inorganic matter have each a distinct mode of crystallization.

2. The fixed angles for each species of matter in some way characterize molecular or cohesive attraction.

3. Polygonal forms result from the attraction acting more strongly in certain specific directions than in others. If the attraction acted alike in every direction it would produce a sphere.

4. Cohesive attraction is characterized by fixed angles as regards the direction of its action, and by specific relations of force in certain axial directions; and it differs in these particulars for different substances.

The whole science of crystals is based upon rigorous mathematical laws. Various attempts, more or less successful, have been made to demonstrate that this is true also of organic bodies.*

5. The axial lines of cohesive attraction are not indefinitely fixed in position, but are in some way modified in direction and force by temperature.

6. The action of cohesive attraction is often intermittent, producing seriate results (as exemplified in the cleavage of crystals); and the specific rate of intermittent action is different for unequal axes.

* See Studies in Organic Morphology, by John Warner, Philadelphia, 1857. Also, by the same author, Contributions to Organic Morphology: containing the mathematical imitation of the Egg of Planorbis Corneus, and Epiornis; and upon the resemblances between Mathematical, Acoustic, Electric, Optical, and Organic Figures.—*Proceed. Acad. Nat. Sci.*, Dec. 1862, p. 525.

seen, to take on the rounded or globular form; while angularity, or the polyhedric shape, stamps the inorganic world. Now, with these peculiarities must be associated other features, such as the fact that organic matter is tougher, less brittle, and has more elastic power to elude disruptive forces than inorganic.

It is a general and well-known law in physics that a reduction in the temperature of metals, whether by condensation under the hammer, exposure to a very cold medium, or in any other manner, is accompanied by a loss of tenacity or cohesive power between the particles of the body whose temperature has been diminished, so that they become so brittle as to be broken oftentimes with the slightest blow. Especially is this the case if the cooling be very sudden, as is shown in many minerals, steel, glass, and other substances. The addition of caloric, on the other hand, gives rise to or increases the property of malleability, as Black clearly showed. In this connection it is worthy of remark that substances which, in the uncrystallized state, are more or less tough, become brittle upon crystallizing. In his philosophical, but little-known essay referred to above, Lardner Vanuxem cites many examples of this fact with a view to their bearing upon the interesting subject under consideration.

"Thus pure iron is extremely tough, and exhibits no crystalline appearance; but if it be combined with a small portion of carbon, phosphorus, sulphur, silver, &c., it loses its toughness and acquires a crystalline or lamellar fracture. Silver, when suddenly congealed, is a brittle metal, for it is then in the crystalline state; but when melted, if it be slowly cooled, it loses its crystalline state and becomes tough. Zinc is extremely brittle at the ordinary temperature of the atmosphere, and is highly crystalline in its fracture, but if heated to a certain degree it becomes a malleable metal."

"The fibrous state of minerals appears to be a semi-crystallized state, for the fibrous varieties of the same species of minerals are more tough than those varieties which are crystals or present a higher degree of crystallization than the fibrous state."

Now, crystallization is always accompanied by an evolution of heat.

Thus, then, we necessarily arrive at the conclusion that the fibrous and crystalline conditions, and the properties of malleability and brittleness, are intimately connected with, and, in fact, dependent upon, the calorific condition.

Here we see, as a general thing, toughness and malleability associated, and depending on a higher calorific state; while brittleness and the crystalline condition are combined with a lower calorific state. Exactly in what manner heat acts to produce this property of toughness, it is difficult to describe. But certainly all the facts of physical and chemical science lead to the supposition that it can only be induced by some atomic or molecular change, and most probably by the production of the globular form, "for that state, as it causes particles to present a greater surface to one another when struck, from the flattening produced, must have their attractive power increased; whilst in polyhedral forms, no property of this kind can exist."

"These facts, and others equally well known, of the effects of heat upon inorganic matter, confirm the opinion advanced by some physiologists, namely, that the elementary particles of organic matter were globular; and accounts for the greater toughness of organic matter, compared with inorganic matter; as well as for the opinions entertained of the forms of matter; for we find that particles of common matter, uncombined with ethereal matter, are polyhedral; but when combined with ethereal matter are globular."

As we have said above toughness pre-eminently characterizes organic matter, and here we find fully developed the globular form.

Now it is a well-established fact that organic matter is composed mainly of the gaseous elements—the lightest and most ethereal kinds of matter known to the chemist—that, in fact, which has the most caloric around its particles, while inorganic matter is composed of the most inert and heaviest, that which has least caloric.

"There is," writes Spencer, "a certain significance in this. When we remember how those redistributions of matter and motion which constitute evolution, structural and functional, imply motion in the units that are redistributed; we shall see a probable meaning in the fact that organic bodies, which exhibit the phenomena of evolution in so high a degree, are mainly composed of ultimate units having extreme mobility. * * * * * * * One of the leading properties of any substance is its degree of molecular mobility; and its degree of molecular mobility more or less sensibly affects the molecular mobilities of the various compounds into which it enters. *Hence we may infer some relation between the gaseous form of three out of the four chief organic elements, and that comparative readiness displayed by organic matters to undergo those changes in the arrangement of parts which we call development, and those transformations of motion which we call function.*"[1]

From the interesting experiments of Acherson, so ably discussed by Wittich, Harting, Melsens, Panum, and others, and from what we know of the progressive physical changes which take place in the chyle as it passes onwards through the lacteals into the thoracic duct, we see that the globular form of the organic cell is that naturally assumed when oily and albuminous matters are brought into contact. But oil and albumen consist of hydrogen, oxygen, nitrogen, and carbon chiefly—the most ethereal forms of matter, those in other words possessing the highest calorific condition and exhibiting the greatest degree of molecular mobility.

In this conjunction the experiments of Boutigny, already referred to, are worthy of consideration. These experiments show us, among other truths, that certain inorganic substances may be made to assume the globular or spheroidal form by increasing artificially their calorific condition, or, in other words, by rendering their calorific condition in a measure analogous to that which, owing to their peculiar material composition, naturally appertains to organic substances.

These facts, taken in connection with numerous others marshalled in argumentative array in our Essay on Atomic Heat in relation to Crystalline Form, clearly indicate that the forms of bodies are not "ultimate facts," not "hieroglyphs no priest can read," and that vital phenomena result not from the union of proximate principles with spherical form, as Lewes maintains; but, on the contrary, find their origin and cause in those molecular movements by means of which forms are evolved from a structureless, homogeneous blastema, and which constitute the primitive steps in that complex series of differential changes which make up the physiological history of growth and development in both the vegetable and animal worlds.

An attentive study of these changes and a comparison of them with the molecular movements which in the inorganic world result in the production of crystalline form, must in the end shed a flood of light upon the active principle or force which produces these changes alike in both divisions of

[1] We have italicized the above sentence on account of the deeply important generalization which it enunciates.

nature. Philosophy and science are equally hopeful, indeed, that a careful analysis and comparison of the varied phenomena exhibited by the different departments of nature, will lead to the identification of their physical causes as modifications of one great force or principle which pervades and binds together the whole universe, and in which, as the chief agent in the hands of an omnipotent Deity, will be found the physical unity of nature.

The more intimately we become acquainted with the statical and dynamical characters of organic and inorganic matter, the more closely do we find these two kingdoms encroaching upon and blending with each other like the different tints or hues of any particular colour. The more boldly we push our researches into the vast unknown, the more evident is it that the phenomena of the inanimate world are inseparably linked to those of the animate, and that all the mechanical, chemical, and vital actions of matter glide into each other so regularly and so gradually that the conclusion is undeniable that they are parts of one grand phenomenon. To this scientific truth the philosopher-poet of Germany has given a fitting harmonic expression.

> "Wie alles sich zum Ganzen webt,
> Eins in dem andern wirkt und lebt?
> Wie Himmelskräfte auf- und niedersteigen
> Und sich die goldnen Eimer reichen,
> Mit segenduftenden Schwingen
> Von Himmel durch die Erde dringen,
> Harmonisch all das All durchklingen."
> FAUST'S *Soliloquy.*

The material world is in truth one great whole, and the details of its study thus far accumulated authorize us to conclude that the passage from the simplest to the most complex form is through gradual and insensible transitions. At one end of the series we have elementary or binary matters composed chiefly of metallic bases, the most dense, gross, and inert of the ponderables; and at the other end bodies composed in great part of the most light, active, and mobile species of matter. Between these two extremes there is no absolute *essential* difference. Everywhere we encounter the same matter and the same forces. Increasing complexity of structure is associated step by step with increasing complexity in the axial directions along which force exerts itself. Complex combinations of molecules beget complex phenomena, which may be varied indefinitely according as molecular arrangement is altered. From the beautiful labours of Pasteur, just passed in review, we learn how an important physiological process is influenced by a change in molecular arrangement. The researches and observations of Boutigny, Vanuxem, and many others whose names might readily be mentioned, and the admirable generalizations of Spencer quoted above, all significantly point towards this great philosophical truth, that between the so-called dead and living nature phenomenal differences only can be demonstrated. As the animal or vegetable cell, in running through its career of development, passes from the general to the special, from the homogeneous to the heterogeneous, so the organic world, as a whole, with all its varied life-manifestations, is simply an evolution from the inorganic.

From these statements, it is evident that a truthful and comprehensive theory of organization should, as one of its prominent features, connect rather than dissociate the inorganic and organic worlds. Let it not be said that such a theory detracts from the doctrine of life.[1] On the contrary,

[1] See Mulder, op. cit., p. 1.

we see in this dissociating influence, an inherent defect in the opposite, or so-called teleological theory. The latter separates nature, so to speak, from itself. It limits nature by claiming for a part what alone can be predicated of the whole. It assigns a superior dignity to organic matter as such, forgetting that the test of dignity is function alone.[1] Carbon, oxygen, hydrogen, and nitrogen have a much more exalted rôle to perform in the animal economy, and consequently may be said to be more dignified than the same elements which, after the death of the animal, come to constitute a crystal of carbonate of ammonia, where their sole duty is the preservation of a definite form. An organized form, according to Burnett, is simply a colligation of molecules of plastic matter occurring under the direction of a determinate idea or force. In common with most teleological writers, he thinks that this force must be peculiar and different from any belonging to matter generally; that it is an immaterial one, and can be likened to no other in nature with which we are acquainted. If we define an organism as simply a collection of molecules of plastic matter arranged in accordance with a certain type or species to which it belongs, we may similarly say of a crystal, that it is an aggregation of molecules arranged in conformity with a certain definite form. In this case the molecules are not plastic in the physiological meaning of the term. Nevertheless, the cause of crystallization is enveloped in as much obscurity as the cause of life and its diversified phenomena, and, without doubt, an explanation of the one would tend measurably to dissipate the mystery of the other. The physical nature of the first no one questions, but in treating of the second, the teleologist resorts to the action of forces that "can be likened to no other in nature with which we are acquainted." Writers of this school, of which we consider the remarks of Burnett on the philosophical relations of cell-studies to be a fitting representative, speak of organism as existing in virtue of preexistent ideas in nature, the antecedent and immaterial form expressing itself in matter. This is the Platonic conception, somewhat curtailed, however, of its comprehensiveness. For that philosopher, judging from many passages in his writings, especially in the tenth book of the Republic, appears to have thought that there was an antecedent divine idea or image of *all* things in nature, inanimate as well as animate, thus, in reality, maintaining the physical theory of organization.

"Adopting the physical theory, one does not recognize," says Burnett, "that the forces of organized are more in number, or different in character from those of unorganized matter, the fact of organization being due to a certain combination of powers possessed by all material forms. And when this combination has once taken place, there necessarily results in virtue of it, and the forces impressed on matter in its beginning, a certain end, which is called individual existence. The common phenomena of organization, therefore, are due to the blind working of the laws of necessity, and which are irrespective of any purpose."[2]

Now very certainly all purposive effort must reside in and be co-existent with the Efficient Cause of all things. This fundamental, theistic fact is lost sight of by the supporters of the teleological doctrine. Taking it as a stand-point, we cannot avoid the conclusion that, the purposive effort keeps

[1] The Cell; its Physiology, Pathology, and Philosophy. Part III. The Relation of Cells to the Physical and to the Teleological View of Organization, by Waldo J. Burnett, M. D., of Boston. Transactions of the Amer. Med. Association, vol. vi. p. 820.

[2] Op. cit., p. 821.

pace with the active developing laws of nature, and gives to them an intelligential aspect. Otherwise the Almighty cannot be said to be displayed in all his works. Physical forces thus purposively impressed from the beginning become active agents working out, not blindly, but intelligently, the so-called "individual adaptation" in all places, assigning a definite object or purpose as well as a definite form to all things. Such a view admits of no blind, necessitous action in any department of nature, but recognizes in both the inorganic and organic worlds that unity of purpose and of action upon which their harmony depends, and which manifests itself by regular, orderly working through all space and all time.

The advocates of the teleological doctrine contend that the adaptation perceived in the organic differs in character from that exhibited in the inorganic world; the latter being considered as "having reference only to existing circumstances, while the only surety of its continuation is in the persistence of the forces on which it depends." It is not difficult to find refutations of this very restricted mode of viewing the operations of nature. Let us examine, for a moment, the phenomena or laws of motion as displayed, on a scale so grand, in the solar system. It is familiar knowledge that the sun turns on its axis from west to east; that the planets all revolve in a plane passing through the sun's axis, and in the same direction as that luminary; that these planets rotate upon their axes, the satellites revolve around their primaries, and also upon their axes in the same direction. Equally well known is it that the intensity of light or heat emitted from an incandescent body diminishes in proportion as the squares of the distance increase.[1] From these data it will be seen that a remarkable adaptation exists between the motions of the planets and the calorific power of the sun. For the heating power of the sun, the centrifugal force by which the planets and their satellites are impelled through their orbits, and the centripetal force by which planets are impelled towards the sun, and satellites towards their primaries, are alike seen to diminish in proportion as the squares of the distance increase. Furthermore, by combining the centripetal and centrifugal forces a compound force results, which is the determining agency of the periodic times, or velocity of the planets, and which constitutes the third law of Kepler, that there is a distinct and definite relation between the velocity of the planets and their distance from the sun. The teleological element exists in this relation as well as in the organized kingdom. The adaptation, here, does not consist in mere harmonic action, but is in reality an intelligential production of cause and effect. Without this motion of revolution around the sun, and rotation upon their axes, the planets would be deprived of that change of seasons and alternations of day and night, upon which so many of our climatic phenomena depend. We are perfectly justified in considering these results as constituting at least one purpose or object for the accomplishment of which the law is in action. In this example, then, the reason or purpose may be said to pre-exist its embodiment or expression in the moving planet, accompanying and co-operating with the physical agent in virtue of the fact that all purposive effort must reside in the great Efficient Cause—the world's Supreme Architect.

Take another example, as simple and as well established as it is applicable to the subject under consideration. It is a general law that liquids

[1] "The intensity of heat varies inversely as the square of the distance from the radiant point." (Gmelin.)

expand by the addition of heat. No liquid is so generally diffused and plays so important a part in the economy of nature as water, which, singularly enough, between certain thermometric limits, is the only exception to this law. From about 32° of Fahrenheit's scale it contracts for every additional increment of heat, until at about $39\frac{1}{2}$ or 40°, it has attained its maximum density. Conversely, in cooling from 40° down to 32° it expands and becomes specifically lighter. If the mass is undisturbed so as to retain the liquid form, it may be seen to expand, even until cooled down to 20° or 25° below the freezing point. Upon this irregularity of contraction manifested by water in cooling, depends the well being of a considerable portion of the organized world. When winter sets in the surface-water of lakes, rivers, &c., begins to part with its caloric by radiation. This loss of heat is accompanied by contraction, increased density and consequent sinking of the heavier particles to give place to the warmer and lighter water which rises from below. This process continues until the mass has fallen to 40°. Then the beneficent peculiarity in question manifests itself. Further, loss of heat from the surface produces expansion, and diminished specific gravity, and the translation of water from above downwards, and from below upwards, ceases. Hence, while the mass of water below maintains a temperature of 40°, the surface-water steadily sinks towards the freezing point, when it is converted into a sheet of ice, which latter is an effectual barrier to the further loss of caloric. Thus, while the atmosphere of any locality suffers a most distressing depression of temperature, the waters of the rivers and lakes enjoy a much more comfortable temperature. Here then is a happy provision for maintaining intact the life of the finny inhabitants of these waters. During the severity of winter, were it not for this peculiar action on the part of water, the bed of the river would be entirely filled with solid ice, and piscatorial life necessarily annihilated. The philosophic mind must see in this physical property of water no merely accidental or chance action, but an adaptation in the inorganic, as positive and intelligential as any presented in the organic kingdom.

J. A. M.

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ART. XIV.—*Contributions to Practical Medicine.* By JAMES BEGBIE, M. D., F. R. S. E., &c. Edinb., 1862. 8vo. pp. 318.

A PECULIARITY of English medical literature consists in its numerous collections of monographs, in the form of Society Transactions or in that of papers by distinguished physicians, which originally appeared as contributions to medical journals. In many cases, when first published, they formed the earliest introduction of their authors to the profession at large, and became the basis of an ever widening and strengthening reputation. It is gratifying, when a physician has attained his highest eminence, to examine the steps by which he reached it, to trace in his earlier productions the features of his maturer mind, and note with satisfaction how successfully the fruits of his later experience vindicate the approving judgment which was originally passed upon the work of an author, at the time, perhaps, but little known, or who chose to test his claims to favour by anonymous publications. The papers in the present volume, however, were all, except one, read by their author before the Medico-Chirurgical Society of Edinburgh,

and published in the journals of the day, and while they contributed to elevate him among his immediate associates, they attracted attention, and served to mould opinions upon the subjects they discuss, wherever English medical literature exerts its legitimate influence. They reflect in a striking manner the characteristics of their author. Second to none of those common-sense medical philosophers who imbibed the true spirit of research and reasoning from Reid and Stewart, Dr. Begbie has spread over every page of his writings a hearty and honest tone, which we have reason to believe reflects a sound and genial nature, always on the alert to discern the hidden causes and relations of things, and always brimming over with thoughts which his companions and auditors are eager to possess. Perhaps the reader will best apprehend the character of the volume before us by recalling Dr. Holland's *Medical Notes and Reflections*. Its tone is scarcely less elevated, and it discloses a not inferior discernment; perhaps it differs from the work alluded to mainly in its closer adherence to what are reckoned practical subjects, or rather to a more exclusively practical manner of treating them.

The first paper in the volume, and which, as was stated already, has never before been published, treats of "Gout and the Gouty Diathesis." It is peculiarly interesting from the circumstance that the author, like so many others who have felicitously described the disease from which they chiefly suffered, is himself a victim of gout. If Sydenham drew from his own sufferings and the observations and reflections which they suggested, a picture of the disease which has forever associated his name with its history, we must admit that Dr. Begbie has endeavoured to finish the portrait by adding to it lineaments which are often masked under the guise of different affections, and whose name they bear instead of that which more properly belongs to them. Or, to quote the author's own statement, a summary of the doctrine he defends :—

"The primary effects of the gouty diathesis are those of a poison (uric acid), often slow and insidious, disturbing many functions, chiefly those of the digestive organs, and of the nervous centres; but sometimes more speedy, through its rapid accumulation in the system, engendering active disease in various tissues and organs of the body—the synovial, the mucous, and serous membranes being peculiarly prone to be affected by it; while the heart, the liver and kidney participate largely in the general disorder." . . . "The altered or contaminated condition of the blood, in the gouty habit, has subsequently an injurious effect, either vitally or mechanically, on the muscular structure of the heart and bloodvessels, by weakening their power, and producing attentuation of their cavities and trunks, and leading to venous congestion and obstruction, and to their consequences, in hemorrhages, dropsical effusions, and similar affections." "Ultimately the heart and bloodvessels, through the continued prevalence of the diathesis, undergo structural changes by the deposition of earthy matter in their coats; and thus gout is intimately allied with palsy, apoplexy, and other cerebral diseases, and with angina, syncope, and rupture, and other fatal cardiac affections."

These passages scarcely display the extent to which Dr. Begbie believes that gout

"May disclose itself in every organ of the body, and complicate and involve every disturbance of the system. It may visit every part and every texture from the crown of the head to the sole of the foot, and molest, and vitiate every function appertaining to life."

He discovers it in the head in the form of intense and continued headache, in fits of giddiness, in transient affections of the senses, and its

intimate association with lethargy and coma in connection with serous effusion, the result of cerebral disease. He detects it in many cases of paraplegia and neuralgia, in otitis, tonsillitis, and relaxation of the uvula, in iritis, and sclerotitis, and in destructive inflammation of the eyeball. It plays a part, he maintains, in many cases of pneumonia, pleurisy, bronchitis, and hydrothorax; it "more than any other agent lays the foundation of irreparable mischief" in the heart and bloodvessels, and is "the immediate cause of some acute attacks of endocarditis and pericarditis."

"Gout," he asserts, "has frequently its seat in the organs of digestion, complicating their functional derangements, hurrying on their structural diseases, and terminating their organic lesions" . . . "is intimately connected with the disorders of the urinary organs; it is frequently the origin of renal disorder, of granular degeneration of the kidneys, and of puriform discharge from the urethra." . . . It "lurks in many functional diseases of the uterus, and discovers itself in some of its organic diseases. It is the fountain of many hemorrhages and many fluxes. It is the origin and essence of many cutaneous eruptions, and in the joints, the fruitful source of crippling, lameness, and deformity."

Truly gout is *fons malorum!* if we accept our author's interpretation of the cases, some of which are referred to in the above extracts. But this we are unable to do. Evidently all of these affections, diverse and even opposite in their nature, occur habitually in constitutions as free from gout as if such a disease had never existed; and if they sometimes are modified or even replaced by an open fit of gout in other cases, it only shows that this disease, like scrofula and other pre-eminently blood disorders, is capable of modifying the phenomena of more accidental affections. The efficacy of colchicum in the cure of such diseases may, and, we respectfully suggest, does prove only this, that the neutralization of the gouty poison permits nature to work her own cure of the affection which this poison maintained and aggravated. Gout, in such cases, we presume, may be regarded as one of the lædentia, the removal of which, in all methods of treatment, is essential to success.

Dr. Garrod, in his well-known work, has devoted a chapter to illustrating the various forms of irregular gout, and he more than intimates a doubt of views like those which are so strongly expressed, and so ingeniously illustrated by Dr. Begbie. Even after admitting that a gouty diathesis may produce symptoms apart from the joints which are essentially of a gouty character, he finds, when he comes to examine the several varieties of alleged irregular gout, that few of them can unequivocally be accepted as of that nature. He is even so irreverent as to quote with approbation Dr. Watson's remark that "the so-called *gout* in the stomach has sometimes turned out to be *pork* in the stomach." Long ago, Dr. Sutton complained that "the idea of this universal influence of the gout has had this effect, that every disease which has happened during an arthritic paroxysm has been considered to be gout." Earlier still the notion which Dr. Sutton reprobates was inculcated by continental writers. But among the most authoritative of recent French and German writers, as Vogel and Lebert, this confusion is criticized in strong terms. Undoubtedly, gout is a constitutional affection (a blood disease, as it is the present fashion to say), and as inborn peculiarities modify the phenomena of accidental diseases, so do acquired morbid habits produce this effect in a still greater degree, and none more so than the gouty habit. But we cannot assent to the view which magnifies a complication, and converts it into an efficient cause.

In reading the paper which treats of the connection of dyspepsia and nervous disorders with the oxalic acid diathesis, we were struck with the same feeling of uncertainty with which long ago the similar chapter in Dr. Prout's work inspired us. While it must be admitted that there are certain marked differences between the two states of the system referred to, it must also be allowed that so many symptoms are common to both, as to render their direct dependence upon the special condition of the blood a matter of serious doubt. In both the following symptoms occur, *e. g.:* A dry and harsh skin, scaly eruptions, feebleness of the lower limbs, hemorrhage from the bowels, disorder of the kidneys and bladder, dyspepsia, flatulence, and palpitation of the heart, irritable temper, hypochondriasis, and, in the gouty diathesis, oxalates and urates alternate with one another. In a word, the points of resemblance of the two conditions are much more numerous than those in which they differ, and much more than would account for the cure of the one by colchicum and of the other by nitro-muriatic acid, if we did not look beyond the minutiæ of the cases to see those broad and characteristic features in which they are strikingly contrasted—features which may briefly be described as those of the sanguine and of the melancholic temperament. But this fact, if admitted, does not furnish any clue to the essential differences of the two affections, which must be sought in those metamorphoses into which even the prying eye of organic chemistry has not yet thoroughly searched.

The paper on "the Relation of Rheumatism and Chorea" does not now call for so much attention as it deserved in 1847, when it was first published and when the relation had been noticed by only a few writers. The succeeding one, which treats of "the Connection of Erythema Nodosum with the Rheumatic Diathesis," and through it with uterine disorder, is interesting as an additional illustration of the closeness of relationship which exists between many local affections and certain general states of the system. "Anæmia and its Consequences" is the title of a very important chapter concerning an affection, sometimes described as "exophthalmic goitre," and which the author concludes to be a true anæmia, and curable by the ordinary remedies for that disease. If it were not something more, enlargement of the thyroid body and protrusion of the eyes, with palpitation of the heart would be of frequent occurrence, as frequent as anæmia itself; but, while the latter is every day met with, the former is so unusual as to have passed unperceived by the best observers of disease, until a very recent period. This superadded element has remained in doubt, although announced by various authors as a derangement of the organic nervous system. Meanwhile the clear and circumstantial exposition of Dr. Begbie demonstrates that an essential element of the affection is anæmia. His paper is peculiarly valuable as a history of the progress of observation in regard to exophthalmic goitre, and all who desire to be informed upon the subject, will find it their best guide. It is curious to observe how four of the medical celebrities of Paris, MM. Bouillaud, Piorry, Trousseau and Beau, so lately as a year ago, displayed marvellous ingenuity, and abounded in all the arts of the tribune while defending each his theory of the disease before the Academy of Medicine.

In this discussion we find M. Piorry, with characteristic originality, and with that tenacious adherence to mechanical views of disease for which he is so remarkable, maintaining that enlargement of the thyroid gland is the primary element of the disease, causing in its turn derangement of the heart's action by pressure upon the vascular trunks of the neck and upon

the branches of the cranial and the sympathetic nerves. These influences, according to him, determine imperfect hæmatosis and impair nutrition, while "habitual suffering, defective performance of the great functions, and sometimes congestion of the brain resulting from hindrances to its circulation, render the temper irritable and violent, produce habitual mental excitement, and predispose to anger." Consistently with these theoretical views he pronounces iodine the specific remedy.

M. Bouillaud does not hesitate to deny that palpitation of the heart has any necessary connection with exophthalmic goitre, because it is found in thousands of persons who are neither goitrous nor have protrusion of the eyes. He also ridicules the idea of calling the disease, as described by authors, a neurosis. "A comical neurosis, truly," he exclaims, "for according to the received nomenclature, a neurosis is a disease without visible lesion." After denying any necessary connection between the three characteristic elements of the affection, he concludes by attributing it chiefly to the habit of self-abuse. The connection between the disease and its alleged cause he confesses his inability to point out. In a note he makes, in a single line, a statement which is, perhaps, of more consequence than all the rest of his long and verbose oration. "We have shown," he remarks, "that the cardiac palpitations denote a nervous excitability coinciding with a state of chloro-anæmia." Taking so different a view as he does of the nature of the disease from that of M. Piorry, he, nevertheless, advocates the use of the same remedy, viz., iodine.

The oration of M. Beau is taken up with a lucid demonstration of the dependence of the functional symptoms of the disease upon anæmia, which, he contends, is associated with transitory hypertrophy of the heart. Unfortunately, he throws no light at all upon the causation of the projection of the eyeballs nor on that of the enlargement of the thyroid gland. It is not sufficient to say that those phenomena are sometimes absent. Usually they are not so; and the cause of their presence when they do occur is precisely what we desire to learn. A very important statement made by M. Beau, is that having carefully inquired into the causes to which the development of the disease was due in seven cases, he found them all to be such as affect the feelings deeply, as reverses of fortune, disappointed affection or ambition, &c. Against such causes, he very justly remarks, the materia medica contains no antidote.

The discourse of M. Trousseau was distinguished by that elegance and brilliancy which are the characteristics of his style, and which subject him to the criticisms of brother Academicians who may use language as keen and trenchant, but certainly neither so dazzling nor so clear. It was the first in order, but, as the most important, we have reserved it for notice until the last. Instead of assigning anæmia as the primary link in the chain of morbid conditions, he declares that nervous disorders, mental, gastric, or uterine precede or accompany the three characteristic phenomena of the disease; but the primary symptom is excessive action of the heart. This symptom he refers to disorder of the great sympathetic nerve, citing in explanation of his doctrine, the experiments of Claude Bernard. To the same disorder he attributes all the symptoms displayed by the great vessels, the digestive organs, the kidneys and the eyes, as well as the congestive enlargement of the thyroid body. Between him and M. Beau the most conspicuous difference is that the latter regards anæmia as the primary element of the affection, while the former holds it to be a consequence of the deterioration of nutrition produced by nervous derangement. Probably the condition of

the blood and that of the nervous system are so closely associated that one cannot be impaired without injury to the other; yet, taking the cases of M. Beau as evidence, the latter would appear to be the first affected, as M. Trousseau maintains. Such a conclusion is arrived at by Prof. Laycock in a paper, the essential portion of which is reprinted in the present number of this Journal. It may be remarked that M. Trousseau declares no benefit is to be derived from the use of iron in this affection, but, on the contrary, that it aggravates the symptoms; that according to him iodine will equally exasperate them; and that the most successful remedy is digitalis associated with such measures as are adapted to restore the suppressed menses.

The paper on "Fatty Degeneration of the Heart," particularly as a cause of sudden death, is peculiarly interesting from its containing an account of the sudden death of two great illustrations of Scottish literature and science, Dr. Chalmers and Dr. Abercrombie, who both fell victims to this disease. The essay on "Erysipelas" contains, we believe, one of the earliest evidences of the efficacy of muriated tincture of iron in this affection, although the author associated with it other remedies which he would probably, at this day, consider superfluous if not injurious. In like manner, Dr. Begbie appears to have seized the just idea of a pathology of "Diphtheria and its Sequels," when he contends for its being a toxæmic disease, and not a local inflammation. His essay on the "Therapeutical Effects of Arsenic" is one of the wisest that has been published in regard to this powerful agent; and although it does not profess to furnish any novel results, it tends to rationalize our use of the remedy, by showing the common elements belonging to the diseases which it is adapted to cure. The employment which he recommends of it in chronic bowel complaints is worthy of the attention of our physicians who have the care of patients affected with these disorders contracted during the hardships and complicated sicknesses of camp life. A paper "On the Sedative Powers of the Datura Stramonium" closes the volume. It may serve to recall the earlier results of its use in neuralgic and rheumatic affections.

In conclusion, we can only repeat the expression of high appreciation which we entertain of these essays, stamped on every page with marks of the author's thoroughly sound sense, and of his acute perception of the essential elements of certain diseases, and of those which they possess in common with others, which, at first sight, contrast with, more than they resemble them. A. S.

# BIBLIOGRAPHICAL NOTICES.

ART. XV.—*A Practical Treatise on Fractures and Dislocations.* By FRANK HASTINGS HAMILTON, A. B., A. M., M. D., Lt. Col.; Medical Inspector U. S. A.; Professor of Military Surgery and Hygiene, and of Fractures and Dislocations in Bellevue Hospital Medical College; one of the Surgeons to Bellevue Hospital, New York; Professor of Military Surgery, etc. in the Long Island College Hospital, Brooklyn; Author of a Treatise on Military Surgery. Second edition, revised and improved. Illustrated with two hundred and eighty-five woodcuts. Philadelphia: Blanchard & Lea, 1863.

IT gives us sincere pleasure to call attention to the issue of a second edition, so soon after the publication of the first, of this excellent treatise of Dr. Hamilton. We esteem it to be one of the best of our native medical works, one of which the profession of this country may be proud, and it would seem that the profession here as well as the reviewers abroad fully appreciate its merits.

The present edition has been most carefully revised; some portions have been amended, some paragraphs have been excluded, and considerable additions have been made, rendering it, as the author desired, "a faithful record of the progress of that branch of surgical science of which it treats." As the work has been placed upon the United States Army Supply Table for Post and General Hospitals, and, moreover, information on the subject being generally demanded at the present time, a new chapter, on "Gunshot Fractures," has been added.

There are but very few portions of this book which are at all obnoxious to criticism; and these we shall point out.

The first chapter in Part II., on Dislocations, entitled "General Considerations," is much too meagre. The section on the pathology of these lesions is one we might point out, particularly, as not affording the information necessary for understanding the condition of the parts concerned, in recent and in old dislocations. This condition of the parts has been well studied and carefully described, and far from being a matter merely of interesting speculation, it is second to none other in practical importance, as by its knowledge alone can the surgeon determine what he is called upon to perform, and how and when it is best for him to proceed.

In the chapter on Tarsal Luxations, when treating of dislocations of the astragalus, the only mention made of section of the tendons, which offer the chief impediment to the restoration of the bone to its normal position, is this: that Mr. Erichsen suggests in case of a failure by the ordinary means, we should resort to a subcutaneous section of the tendo-Achillis. The study of a paper by Mr. George Pollock, in vol. xlii. of the *Medico-Chirurgical Transactions* (1859), would induce Dr. Hamilton to add considerably to what he has said on this important point.

The newly added chapter on Gunshot Fractures is but four pages in length. This is evidently much too brief, and consequently, though there is not one sin of commission therein, there are very many of omission. We felt greatly disappointed on finding this chapter so meagre, for to no one would we look with more confidence than to Dr. Hamilton for information in regard to gunshot fractures. His recent extensive personal experience as a military surgeon, and the study of the specimens in the army medical museum, added to his previous researches and knowledge of the literature of the subject have surely enabled him to give the profession something more than what every member of it should already have known.

We feel called upon to express our admiration of the manner in which the publishers of this work have again performed their task. The paper, the printing, and the illustrations of this large volume are truly admirable.

W. F. A.

ART. XVI.—*Catalogue of the Army Medical Museum, Surgeon-General's Office, Washington, D. C., January* 1, 1863. Washington: Government Printing-Office, 1863. 8vo. pp. 58.

THIS catalogue contains a list of the objects collected up to the beginning of the present year, for the purpose of preservation in the Army Medical Museum of the United States, established last August by the Surgeon-General, William A. Hammond. Thirteen hundred and forty-nine objects are herein recorded, comprehending not only surgical and medical pathological specimens, but also the missiles by which injuries are inflicted in war.

Of these specimens, nine hundred and eighty-five are surgical, one hundred and six are medical, and one hundred and thirty-three are missiles, the greater number of which have been extracted from the body. An interesting portion of the collection is a series of projectiles for small arms, field and heavy guns; and also a complete set of the bayonets now in use in our own and foreign services. For this important addition to the Museum, prepared at the Washington Arsenal, Dr. Brinton, the curator, expresses his indebtedness to Lieut. Col. Geo. D. Ramsay, of the ordnance department of the army.

Each one of these objects has been appropriately and permanently mounted; the dried preparations on stands, and the wet in glass anatomical jars, of the most approved patterns, and constructed for the purpose. We feel ourselves entitled, from personal observation, to speak of the manner in which these preparations have been made, as manifesting the most admirable skill and carefulness. A label is attached, on which is inscribed its catalogue number and the name and rank of the medical officer from whom it was received.

In the catalogue now before us, which has been prepared by Dr. Wm. Moss, Assistant Surgeon U. S. A., a brief description of every object is given, and on the same line, in a separate column, its museum number and the name of the contributor. When a sufficient history has been received of a specimen, an asterisk is attached to the number. It will be noticed with regret that a large proportion of the numbers are not accompanied by this mark, and it is to be hoped that medical officers recognizing their contributions will exert themselves to supply this deficiency.

As no attempt has been made to classify the specimens in the museum, the object for the present being simply to collect and preserve, and as no general observations are made in the pamphlet before us, we can now do little more than call the attention of our readers to what has already been accomplished by the able hands to whom the Surgeon-General has committed the important task of forming an army medical museum. W. F. A.

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ART. XVII.—*The Principles and Practice of Surgery, embracing Minor and Operative Surgery; with a Bibliographical Index of American Surgical Writers from the year* 1783 *to* 1860. *Arranged for the use of Students, and Illustrated by* 400 *Woodcuts and nearly* 1000 *Engravings on Steel.* By HENRY H. SMITH, M. D., Professor of Surgery in the University of Pennsylvania, &c. In two volumes. Philadelphia, J. B. Lippincott & Co., 1863. Octavo, pp. 826 and 769.

THE present volumes we are informed, in the preface, embrace the substance of the author's three treatises, on "Minor Surgery," on "Operative Surgery," and on the "Practice of Surgery." The whole of these three treatises, it is there stated, "*has* been carefully revised, a considerable portion rewritten, about five hundred pages of new matter added, and the work specially prepared to serve as a text-book or aid to those in attendance on surgical lectures."

From the just and comprehensive reviews of these several works published in this journal at the time of their appearance, its readers are acquainted with the treatises above enumerated. In his work of revising them and of re-writing portions, in the preparation of the two volumes before us, the author has stopped far short of such changes, both in style and in matter, as were required in a text-book for students. At the risk of appearing like the man in Hierocles, who carried a brick about with him as a sample of a house, we will present the following prescription as it was given in the first edition of the Practice of Surgery and as it is found now *revised*, assuring our readers that it fairly exemplifies the changes made throughout the work. There is some improvement, but it is by no means sufficient:—

"℞. Mentha piperita, origanum vulgare, rosmarinus officinalis, salvia officinalis, thymus vulgaris, flores lavandula vera, āā ℥ij; vini rubri (claret), Oij. Mix, and let it stand fifteen days."—*Treatise on the Practice*, &c., p. 118.

"℞. Menthæ piperitæ, origani vulgaris, rosmarinus officinalis, salviæ officinalis, thymus vulgaris, flores lavandula vera, āā ℥ij; vini rubri (claret), Oij. Mix, and let it stand fifteen days."—*The Principles and Practice*, &c., vol. i. p. 261.

The additions that have been made to the present work, we regret extremely to say, are not found where they were most needed. There is, for example, a chapter, or rather a section of a chapter, on pyemia in the *Treatise on the Practice of Surgery*, where the whole of this subject, than which there is none more important, is treated of in less than eighty lines.

To this section nothing has been added in the present volumes, and we still read the extraordinary statement which is intended as a reason for this, that this "disease, though of frequent occurrence in the hospitals of Europe, is not common in the United States, and therefore merely requires this brief allusion."

The student who relies upon the work before us for information in regard to what awaits him in his future career, and for ability to recognize and encounter the difficulties of the practice of surgery, will find himself most sadly disappointed.

The volumes are so profusely illustrated, that the work might be styled the *Pictorial Practice and Principles of Surgery.* W. F. A.

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Art. XVIII.—*Reports of American Hospitals for the Insane.*

1. *Of the Massachusetts State Hospital, at Taunton, for the year* 1861.
2. *Of the Butler Hospital, for the year* 1861.
3. *Of the Retreat for the Insane, for the fiscal year* 1861–62.
4. *Of the Vermont Asylum, for the fiscal year* 1861–62.

There is great diversity in the corporate title of our establishments for the treatment of mental alienation. We have Lunatic Hospitals and Lunatic Asylums. We have Insane Hospitals and Hospitals for the Insane. We have Insane Asylums and Asylums for the Insane. We have a Retreat for the Insane and an Asylum for the Relief of Persons deprived of the Use of their Reason, the latter title going all about the country to avoid what was formerly considered a stumbling-stone, but which is a stumbling-stone no longer; and, finally, we have a Bloomingdale Asylum, a Long View Asylum, a Maryland Hospital and a Mount Hope Institution, each without any prefix or appendix indicative of the special purpose of the establishment to which it belongs.

In consideration of these differences we have heretofore, in the title of the articles in which we have reviewed the reports of these establishments, employed the word "Institutions," that being a generic term comprehending all the titles aforementioned. We have now discarded that word and use "Hospitals" in its stead. This, by some, may be thought a small matter, and unworthy of the paper and ink which we have already expended upon it. We do *not* so consider it, but believe it worthy of still further consideration.

There is general uniformity in the objects of our several establishments for the Insane. Whatever might have been the original character and purpose, whether curative, or simply care-taking, or custodial, they have become, in the progress of time, *curative*. They are, therefore, essentially *Hospitals*. Hence, we think they should be called *Hospitals*, and that such should be their legal title, and not Asylums, Retreats, or Institutions.

But this is not enough. They should have a specific or discriminative title, to prevent misunderstanding or the confounding of them with hospitals for other purposes. By what term shall the discrimination be made? The word "Lunatic," employed in its original and philological signification, is simply incorrect. It conveys a false idea. Let us abolish the use of it *in toto*. The word "Insane" falls more agreeably upon the ear, and it has the pre-eminent advantage of truthfulness, as applied to the hospitals in question. We now have our principal terms. In what relation to each other shall we place them? Shall we say Insane Hospital, or Hospital for the Insane? The former expression has the advantage of brevity, of compactness, but it falls—it has always fallen—disagreeably upon our ears, and we rarely, if ever, either hear it or read it, without feeling disposed to exclaim, "Insane Hospital! Why, a hospital can't be insane!" The title "Lying-in Hospital" sounds sufficiently appropriate, although hospitals have not fallen into the habit of lying-in. "Smallpox Hospital" sounds well enough, even though hospitals require no vaccination to procure exemption from variola; and so also "Syphilitic Hospital." Not so with "Insane Hospital." But whence the difference? Probably from the fact that the words "Lying-in," "Smallpox," and "Syphilitic," signify, the first a corporeal condition, and the last two, corporeal, or physical diseases, diseases of *matter*, and the incongruity of applying them by grammatical construction to other matter than that to which they are strictly appropriate, is not so manifest as to appear absurd; while the word "Insane" implies mind, intellect, intelligence: it is properly used in a psychological sense alone, and hence if it be, even only by grammatical construction, applied to brute matter, to a hospital, the impropriety instantly becomes annoyingly evident. Hence, we reject the title "Insane Hospital" and fall back upon the only appropriate one—"Hospital for the Insane."

It is to be hoped that the time will come when, for the sake of uniformity, for the sake of propriety and truthfulness, and for the sake of that advantage which the change would yield by conveying less unpleasant impressions, this title will be universally adopted. So important do we consider this subject, that we would suggest to the members of the Association of Medical Superintendents of American Institutions (Hospitals?) for the Insane, to petition the State Legislatures upon it, or to take some other measures, if others are better adapted to the end in view, whereby the change may be effected.

We are not the first to broach this subject. Dr. Kirkbride gave his views upon it in his report for 1858; and as he made it still more comprehensive than we have, some extracts from his argument will add force to that which we have written.

"The *nomenclature* formerly applied to insanity, and to establishments for its treatment, and unfortunately not yet entirely given up, is far behind the age, and has done more harm in influencing men's minds in reference to both, than is generally supposed. In the days when 'cells' and 'keepers' were spoken of, the natural inference was that they belonged to prisons, for these are prison terms. Even now, it occasionally happens that such terms are heard from individuals who, themselves, often occupy smaller apartments, more inconveniently located, more poorly warmed, ventilated and lighted, and not better furnished, and yet who would seem greatly surprised if asked whether they had comfortable 'cells' in the fourth or fifth story of their hotel or boarding-house. There is no reason for thus designating the better of two chambers, that would not apply to the poorer of the two; nor should a nurse and companion of an insane person be styled a 'keeper' any more than if having the care of a case of ordinary sickness.

"So of the institutions themselves; if they are for the treatment of disease, they should be called 'hospitals.' * * * * This institution having at its

commencement been as far wrong in reference to a title as any other, and having made the change, I have no hesitation in speaking of the good results which have followed. The early drawings of this building will show that it was first styled the 'Lunatic Asylum of the Pennsylvania Hospital,' but before it was opened, the name was very properly changed to that which it now has, 'The Pennsylvania Hospital for the Insane.' The State Institution at Harrisburg also modified its title for the better, but it only did one-half the work. Originally named in the law establishing it, 'The Pennsylvania State Lunatic Hospital and Union Asylum for the Insane,' it dispensed with the latter part of its very awkward title, but unfortunately retained the term 'lunatic,' which, of all terms is the most obnoxious to patients, and one of the most unfortunate and irrational that can be applied to such establishments or to a case of insanity. * * *

"'Asylums,' or 'Retreats,' places of refuge or security, are not provided for the treatment of fever, or rheumatism, or other diseases, nor should the institutions for the treatment of insanity be so called."

We proceed to an examination of the reports—

1. The proposition, in a former report, by Dr. Choate, of the *Massachusetts State Lunatic Hospital*, at Taunton, to limit the number of patients at that institution to four hundred, has not, as will be perceived by a perusal of the following statistics, been acceded to.

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients, September 30, 1860 | 190 | 171 | 361 |
| Admitted in course of the year | 131 | 121 | 252 |
| Whole number | 321 | 292 | 613 |
| Discharged, including deaths | 111 | 91 | 202 |
| Remaining, September 30, 1861 | 210 | 201 | 411 |
| Of those discharged, there were cured | 68 | 51 | 119 |
| Died | 27 | 25 | 52 |

Died of phthisis, 12; maniacal exhaustion, 7; marasmus, 5; apoplexy, 4; chronic mania, 4; anæmia, 3; paralysis, 3; softening of the brain, 3; disease of the heart, 2; diarrhœa, 2; fever, 1; old age, 1; gangrene, 1; disease of the liver, 1; erysipelas, 1; epilepsy, 1; pneumonia, 1.

In his remarks upon the curability of insanity, Dr. C. mentions the following as established facts:—

1. "The inhabitants of large cities afford a smaller proportion of cures than those residing in the country."

2. "Previous habits of intemperance and dissipation, by breaking down the constitution, diminish the hopes of effecting a cure."

3. "In this country, disease occurring in those who have emigrated from foreign lands to our shores, is more likely to be beyond the reach of remedial treatment."

The two subjoined extracts from the report, one upon the prevention of insanity, the other upon its causes as exhibited in the patients admitted in the course of the year, and in the former of which direct allusion is made to the latter, are worthy of very attentive perusal.

"The inculcation of wise counsels among the people as to modes of living, the diffusion of more correct views as to the causes of insanity, and the rules to be thence deduced as to the best means of avoiding it, can alone be relied upon to diminish this wide-spread and growing evil. In the proper place it will be shown in this as in former reports, how large a proportion of the whole number of cases admitted have been brought upon the sufferers by causes over which they had entire control; how many are due to foolish and unsatisfactory and criminal indulgences; how many to habits of life in some respects praiseworthy, but in their relation to the physical and mental health to be condemned and avoided; in short how great a diminution might be brought about in the number afflicted with this scourge, were only the true rules of life and health fully understood and obeyed throughout the community.

"At the present time especially, when new and powerful sources of mental excitement are being presented to the minds of our fellow-citizens, and when the

deprivations and disturbances and anxieties of war are adding new causes of mental derangement before unfelt in our midst, does it become us to endeavour by every means in our power to urge an obedience to those laws of nature, which are seldom violated without the exaction of nature's penalty. That there is something wrong in the system of education of the present day, in the luxurious modes of living, in the eagerness with which exciting scenes and thoughts are sought, and in the hazardous and venturesome method of conducting most forms of trade and business, is not a mere matter of speculative remark or curious inquiry, but is a fact fraught with momentous consequences to the moral and mental health of the community. The premature and overstrained employment of the mental powers on the one hand, and the neglect on the other of moral discipline, and of that education which inculcates proper principles of feeling and action, and teaches the restraint and command of temper, emotions and moral affections, are undoubtedly among the most deeply laid foundations of insanity. And upon these are too often raised the structure of incurable disease by unbridled indulgence of the passions, or by a plunge into some of the fashionable excitements of society, or by an entrance upon some speculative and risky method of business, with its necessary attendants of alternate excitement and depression, of elated expectations and painful anxieties, of intoxicating hopes and depressing fears, of glowing anticipations and chilling disappointments. To a reformed and more enlightened system of education, to greater simplicity of living, and a more strict obedience to the moral law, and to a more safe and rational and limited method of business must we look for aid in diminishing the pressure upon the halls of our lunatic asylums." * * * * * * * *

"I will barely call attention at the present time to a few of the most prominent and potent causes on the list. Intemperance, as usual, stands at the head, and has been the acknowledged cause in more than one-fifth of all the cases admitted into the institution since its opening, where the cause was known. Ill-health, which, in a large majority of cases, covers up some radical defect in the habits of life, and is merely a penalty exacted for some offence against nature's laws, is chargeable with another fifth. Indulgence in the lower appetites and passions, too deep absorption in some of the fashionable excitements of society, and a want of care for the preservation of the health, particularly in females at seasons when their systems are peculiarly susceptible to the access of disease, have been assigned as the exciting causes in more than another fifth. These combined causes, which are with few exceptions self-induced, constitute the sources of disease in nearly eighty per cent. of all the cases. It would seem, that such truths as these needed only to be generally known, in order to lead the community to avoid the causes which produce so large a proportion of the cases of this terrible disease. But when sins and vices and neglects operate very gradually, and apparently upon only a portion of those practising them, too many lay the flattering unction to their souls that they shall escape. In nothing more strikingly than in the care of and regard for human health is illustrated the truth of the words of the sacred writer, that 'because sentence against an evil work is not executed speedily, therefore the heart of the sons of men is fully set in them to do evil.' One new cause appears in the table of this year, the excitement of the camp, with its sudden change in the mode of life, its exposures, its privations, and not least, it is to be feared, its excesses and indulgences. To this cause are due the disorders of three young men recently admitted, the youngest of whom is a slender youth of barely sixteen years."

We make some selections from the remarks upon *moral treatment.* It would appear, from one of them, that although the popular excitement attendant upon a state of warfare acts as a cause of mental disorder, it has also some influence as a curative agent.

"Mildness, kindness, and the abolition of all unnecessary restraint, continue to be the ruling principles. No mechanical restraint of any description is used except the camisole, which, very rarely in males, and not frequently in females, is made use of to secure from suicide, to prevent denuding of the person, and to protect the patient herself and those about her from injury.

"Ample reading matter has been furnished to all the inmates who desired it, from the library, which has been considerably increased during the year by the

addition of modern publications, and by the free daily distribution of newspapers.

"The little community here have shared with that outside its walls in the excitements incident to the eventful year which is upon us. That excitement has been with us in the main a healthy one, arousing some from a torpid state of indifference or melancholy, and calling off the thoughts of others from the unhealthy channels where they were wont to roam.

"The usual recreations of riding, walking, bowling, billiards, social parties, picnics, and games and evening entertainments, have been followed up with at least as much zeal as in former years. A singing school has been kept through eight months of the year, with very excellent effect, both as a means of amusement and as a healing agent.

"I should be wanting alike to my feelings and my duty, did I omit to acknowledge with thanks the efforts of many of the convalescent patients to maintain the good order of the institution, to aid in administering comfort to the helpless, and to assist in the domestic work of the household. A large part of the duties of the kitchen, the laundry, and the sewing department, has as usual been most satisfactorily performed by the female patients, while the men have contributed largely to the labour of the farm, the care of the stock, the improvement of the grounds, and the repairs and painting of the buildings and fences."

We shall close our notice of this interesting report by two extracts, one upon the completeness of cures, and the other conveying some information in regard to the impressions made by hospital life upon some of the patients, and both of them calculated to remove erroneous notions of somewhat extensive prevalence.

"A large proportion of all the cures which are effected are not only complete, but permanent, and the individual becomes again as well fitted for the active business of life as he would be after going successfully through any other physical disease."

"During the past, as in previous years, we have had many visits, most agreeable and grateful in their character, from recovered patients; and it may be mentioned as a fact worthy of record, that in three instances former patients came voluntarily and delivered themselves up, feeling within themselves the necessity of a renewal of hospital treatment and hospital care.

"Although the deprivation of liberty to a certain extent must always, especially to the convalescent, be somewhat irksome and tedious, yet the instances are very rare where patients who have been discharged recovered, do not ever after cherish a grateful sense of obligation to the hospital, and keep up a lively feeling of interest in its welfare. In repeated instances in the past as in previous years, patients whose convalescence was fully established, but who had no strong ties of family, or home, or business, to call them away, have expressed a reluctance to leave its friendly shelter."

2. The result of treatment at the *Butler Hospital for the Insane* for the year 1861, are expressed in the following numbers:—

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients at the beginning of the year . . | 68 | 59 | 127 |
| Admitted in course of the year . . . . | 25 | 28 | 53 |
| Whole number . . . . . . . . . . | 93 | 87 | 180 |
| Discharged, including deaths . . . . . | 23 | 22 | 45 |
| Remaining at the end of the year . . . | 70 | 65 | 135 |
| Of those discharged, there were cured . . | | | 22 |
| Died . . . . . . . . . . . | | | 14 |

The diseases which proved fatal are not mentioned.

Instead of entering into the details found in most of the reports, Dr. Ray continues his usual practice of presenting an essay upon some topic connected with the general subject of mental disorders. The subject this year is taken from the broad field of medical jurisprudence.

After having described the change which, in the current century, has been effected in our courts, by the more enlightened views of insanity, he says—

"Notwithstanding the advance thus indicated, it is none the less true that many of our laws and legal practices respecting the insane do not correctly reflect the present state of our knowledge concerning their disease."

One of the subjects upon which the existing laws do not adequately meet the exigencies, is the disposition of persons who have been acquitted on the ground of insanity, of alleged crime. This he discusses at length, premising that the persons to whom the discussion is particularly devoted may be divided into three classes, as follows:—

1. "Those who, at the time of trial, are supposed to have recovered from the disease which led to the offence."

2. "Those who differ from the last in the single particular that they have had previous attacks, and will probably have another at no distant period."

3. "Those who remain insane at the trial, with more or less probability of recovery."

"These classes embrace the various conditions to be provided for, and they must, one and all, be duly recognized in any legislative enactment on the subject."

The discussion is so long as to prohibit us from the reproduction of it *in extenso*, and so *sequential* as to render an abridgment unsatisfactory. We must content ourselves and our readers with the author's *conclusions.* They are as follows:—

"The ground of the acquittal being stated by the jury, the court shall commit the prisoner to the prison or county jail.

"Whenever the liberation of such a person shall be claimed on the ground of recovery, the court shall appoint a commission to make inquiry into this fact; and if satisfied by their report that recovery has taken place, the court shall order his discharge.

"If the person thus recovered shall have had a previous attack, he shall be discharged, on condition that his friends recognize in a suitable obligation for his good behaviour.

"If at any time the court shall be satisfied by the report of a commission appointed for the purpose, that the person, though still insane, has become harmless in consequence of some change in the form of his insanity, or the occurrence of bodily infirmity, it shall consign him to the custody of his friends on the same terms as the last mentioned.

"If in the opinion of the court at the time of trial, or at any subsequent period, the person's recovery would be promoted by being confined in a hospital for the insane rather than the jail, and no important point compromised thereby, it shall signify this opinion to the Governor, who shall be authorized to carry it into execution.

"Thus, all possible exigencies are provided for, not, however, without leaving much to the discretion of the court. This is unavoidable, and in no better hands can such discretion be left than the judicial."

In the course of the discussion, the objections to a commitment to the hospitals for the insane of persons acquitted of criminal acts on the ground of insanity, are thus set forth:—

"Since establishments for the insane have grown into public favour, they seem, as a matter of course, to be regarded as the more suitable place for this class of persons—as if the insanity were the only element in the case worth notice, all others, and especially the social consideration, being quite overlooked. To those practically acquainted with the working of hospitals for the insane, it has long been apparent that the greater part of these people make very unsuitable inmates. Many of them, it must be borne in mind, are essentially criminal—men of the baser sort not improved at all by the incident of insanity. Their companionship can be salutary to none, and must be positively disagreeable to many, for it must be borne in mind that the insane are not entirely devoid of moral sensibilities. Their influence is decidedly bad, in a place where, of all places, the surrounding influences should be decidedly good. The ends to which all modern improvements in the management of the insane have been tending, are to create a high moral tone throughout all their relations to others, to free our hospitals from every repulsive feature, and make them agreeable places of

abode. Especially, has it been thought desirable to banish, to the utmost practicable extent, whatever is calculated to suggest in the mind of the unhappy sufferer, the idea of crime, of punishment, of convicts. Certainly, nothing can be better fitted to defeat these ends than this intimate association between the ordinary insane and those who have been committed for criminal offences. No one who has had charge of a hospital into which the latter have been admitted, can have failed to perceive the irritation and the mischief constantly resulting from this source.

"The effect upon these persons themselves is generally bad. Their history soon becomes known to the other patients; they are looked upon with no favourable eye, and on every little collision, they are reminded in terms more emphatic than courteous, that they are no better than they should be. To none can such relations be very conducive to recovery, and to those who, otherwise correct and exemplary, have, in a paroxysm of disease, been unfortunately impelled to commit some dreadful deed, they must constitute an additional ingredient of bitterness in their bitter cup."

This subject concluded, the author proceeds to a commentary upon a legal practice which, so far as our knowledge extends, has hitherto escaped the animadversions in their printed reports of the superintendents of our hospitals for the insane, but of the evils of which we have but too often been the saddened witness. As the subject is important, new in our notices, and, as we think, interesting to our readers, we shall quote liberally.

"No more fitting opportunity could offer to call your attention to one operation of law, which produces much embarrassment to us and annoyance to those who are its objects. I refer to the matter of guardianship—a measure often necessary to secure the interests of the insane. Whenever a proper application is made, the Court of Probate, to whose jurisdiction the matter belongs, issues its writ directing an officer of the court to notify the parties concerned. He makes his appearance here, is introduced to the patient, draws out a formidable looking paper, and reads it from beginning to end. In this document the patient is told, with no arts of circumlocution, that he is a lunatic; that certain persons have applied to the court for the appointment of a guardian of his person and property; and that he may appear, if he see fit, at a specified time and place, and show cause, if any he have, why the appointment should not be made. Now, this is a very simple and intelligible thing, and the man should be thankful for the paternal interest thus manifested by the law in his affairs. And most certainly he would, if this lunatic, as he is called, would but take a reasonable view of the case. But in all seriousness, I do not hesitate to say, that if any more effectual means can be devised for awakening the suspicions and alarms of a patient, for rekindling the smouldering flames of excitement, and thus arresting the course of any restorative process, I know not what it is. On no description of patients, except the raving and demented, who would neither understand nor care about the measure, can its effects be otherwise than bad. There is no more common trait of insanity than a fixed belief that the patient is the object of hostility, annoyance or opposition, in some shape or other. Whatever form the feeling may take, it is invariably exaggerated, and sometimes to an alarming extent, by such a scene as I have described above. If the hostility is attributed to particular individuals, the patient refers the measure to them, who, as he conceives, not satisfied with getting possession of his person and thrusting him into a prison, complete their malignant work by stealing his property. If the feeling consists in a vague sense of opposition and difficulty, pressing upon him from every side and crushing him to the earth, the measure comes as confirmatory proof of the presence and power of the adverse influence, and furnishes fresh occasion for the most poignant distress. Another, who believes he has been arrested in the midst of the wisest plans, and regards his confinement, therefore, as an act of gross injustice, must necessarily be enraged to find that this injustice has been consummated by stripping him of all his property. Another, whose mind is entirely loosed from its propriety, and borne about by every wind of morbid fancy, finds in the proceeding only a fresh stimulus of excitement and extravagance.

"The whole proceeding is contrary to the principles and practice that charac-

terize the modern management of the insane. They do not, generally, believe themselves to be insane; and though we who mingle with them frankly express our own convictions on this point whenever it cannot be avoided, yet we are careful never to thrust the unpleasant fact in their faces. A certain delicacy and reserve on this point will characterize all humane and skilful dealing with the insane. But here, in this proceeding, the patient is summoned into the presence of a stranger who tells him in the most uncompromising terms, that he is a lunatic, and that somebody is endeavouring to obtain the control of his affairs. Is it strange that this declaration, thus unceremoniously made, should shock him beyond endurance? Our experience in this line, during the past year, has been peculiarly unfortunate. In two patients, the reading of the notice raised a storm of excitement which, in one of them, continued for several months, converting him into a violent, dangerous man, and as such, of course, subjected to many restrictions and deprived of many privileges. In two other cases, I undertook to prepare the mind of the patient, by urging, as skilfully as possible, the propriety of the measure. The result was, that one, five minutes afterwards, endeavoured to commit suicide, and the other, in the course of the day, attempted to elope while walking out—both giving, as the reason for their conduct, the communication I had made. These are but specimens drawn from a single year's experience of the serious mischief produced by this mode of procedure, and it becomes a very important question to ask, whether it is really necessary and unavoidable."

After meeting and answering the arguments of the courts in favour of the objectionable practice, the author says:—

"If these views are correct, then every proper purpose would be answered, and all mischief avoided, by providing in the statute, that, no objection being made, the court may dispense with the reading of the notice when satisfied by the testimony of some competent medical man, that such reading would, probably, be detrimental to the mental condition of the party concerned. Such a provision, let me repeat, would save us from much embarrassment; it would relieve the immediate friends of the insane from great inconvenience; it would promote the pecuniary interest of the patient whose affairs may need constant supervision and control; it would prove beneficial to all concerned, and injurious to none."

3. Dr. Butler's report, for the fiscal year 1861–62, of the *Retreat for the Insane*, begins with a tabular statement, from which we copy our customary items.

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients, March 31, 1861 | 109 | 117 | 226 |
| Admitted in course of the year | 79 | 92 | 171 |
| Whole number | 188 | 209 | 397 |
| Discharged, including deaths | 83 | 93 | 176 |
| Remaining, March 31, 1862 | 105 | 116 | 221 |
| Of those discharged, there were cured | 29 | 42 | 71 |
| Died | 7 | 10 | 17 |

Died from general debility, 3; exhaustion, 3; epilepsy, 2; exhaustion of acute mania, diarrhœa, apoplexy, gangrene, inflammatory rheumatism, suicide, disease of the liver, disease of the brain, disease of the heart, 1 each.

"We should be at a great loss in our method of treatment," says this report, "without the aid of our new Amusement Hall. Our entertainments there are so efficient in diverting the mind from painful reflections; they so effectually dispel the thickly coming fancies which shadow the weary hours of anxious doubt and fear; they cheer by that true, earnest sympathy which ever beckons us all on from doubt to hope, that it is no exaggeration to class them among our most efficient remedies.

"Our dancing, musical, and other parties, with exhibitions of our new and improved magic lantern, have been continued through the winter. The additions to the magic lantern apparatus have proved very valuable, rendering it an efficient means of amusement."

In the course of the past year two buildings have been erected, one of them a museum, at an expense of nearly twenty-seven hundred dollars, the other a bowling alley for the women patients, at a cost of more than sixteen hundred dollars. Upwards of five thousand and four hundred dollars has been expended in grading, laying out, and otherwise improving the grounds, and six hundred and sixty-five dollars have been devoted to the purchase of musical instruments, books, pictures, furniture, and contingent expenses. All these sums were raised by voluntary contribution. "Progress" appears to be the watchword at Hartford.

4. From the report of the *Vermont Asylum for the Insane*, it appears that the additional story to the wings adjoining the central building of that hospital which was in progress at the date of the report for 1861, has been completed, adding nearly one hundred rooms to the establishment, and increasing the facilities for a proper classification of the patients.

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients in hospital, August 1st, 1861 | 230 | 208 | 438 |
| Admitted in course of the year | 71 | 75 | 146 |
| Whole number | 301 | 283 | 584 |
| Discharged, including deaths | 69 | 52 | 121 |
| Remaining, August 1st, 1862 | 232 | 231 | 463 |
| Of those discharged, there were cured | | | 47 |
| Died | | | 42 |

"One great source of novelty and entertainment to the patients," says Dr. Rockwell, "is the various manifestations of ideas by other patients. Those whose minds are not too imbecile or demented, easily perceive the insane notions of the other inmates. By this means their minds are diverted from their own delusions, and they begin to distrust their own fancies, and a commencement is made towards their recovery. It is supposed by some that the wild notions of the insane in a lunatic asylum would rather retard than accelerate the recovery of the rest. This is not the case where the inmates are judiciously classified.

"Many of the patients have received benefit by administering to the wants and comfort of their fellow inmates. We always encourage these acts of benevolence, as beneficial to both the giver and receiver."

With upwards of four hundred patients, already within its walls, this establishment is still further enlarged by the addition of nearly one hundred rooms. No such enlargement would, of course, have been made without an expectation of increasing the number of patients. This is another illustration of the practical operation of the proposition, *unanimously* adopted by the Association of Superintendents of American Institutes for the Insane, which declares that no hospital should contain more than two hundred and fifty patients. P. E.

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ART. XIX.—*Report of the Board of Health of the City and Port of Philadelphia to the Mayor, for* 1862. 8vo. pp. 49.

WE have examined with care the report before us, expecting to derive from it some definite idea of the sanitary condition of the city of Philadelphia during the past year—the sources of whatever actual disease may have prevailed within its borders, the possibility of their removal, and the measures best adapted to attain that end. We have, we must confess, been disappointed; the report being neither so full nor so particular as might have been anticipated, considering the importance of the subjects discussed in it, and the known talents embraced in the Board from whence it emanated.

The report informs us, it is true, that the general sanitary condition of the city during the year 1862 was very good; that there occurred no epidemic of an infectious or contagious character, with the exception of smallpox which

prevailed during the early part of the year, though to a less extent than in 1861. So far very good, more especially as from the detailed account given in the appendix of the deaths which occurred in each month of the year with their respective causes, compared with the population, and the general summary of the registry of marriages and births furnished by the Health Officer, we can arrive at a very fair and tolerably exact judgment of the true sanitary condition of the city.

With respect to the sources of disease which exist within the city limits, we are led to infer that they consist chiefly in filthy streets, sewers, yards, and dwellings; in foul, leaky, and badly constructed privies; in stagnant water in yards, cellars, and open lots; in hog-pens, cow-stables, slaughter-houses, and offensive manufactories located in crowded localities; in intermural interments, and, with respect to one district (Kensington), in the impurity of the water supplied for domestic purposes. No data, however, are furnished from which to form even an approximative estimate of the extent to which these nuisances severally prevail, or to arrive at any satisfactory judgment as to the means best adapted for their prompt and effectual abatement and to guard against their recurrence in the future.

The leading and most important object aimed at in the organization of the Board of Health is the prevention of disease in our midst, by guarding against the introduction of any of its causes from without, and, by removing such of these as may exist at home. In carrying out, more especially that portion of its duty which refers to the removal of all domestic sources of disease, the Board must necessarily have confided to it a general supervision of the condition of the air which the citizens breathe, and of the water which they drink or make use of for culinary purposes, and of all the various causes by which the purity of the air and water of the city may be impaired, or rendered unfit for the preservation of the system in a healthy condition. Still better would the Board be enabled to fulfil its sanitary mission were to it also confided the control of the food and clothing of the people; the structure, location and police of the private dwellings and public halls; of schools, churches, lecture rooms and manufactories.

In Philadelphia there exist some very prominent defects in the sanitary police of the city, for the amendment of which the influence of the Board of Health should be constantly and prominently directed.

The entire system of drainage in Philadelphia is defective. There is far too limited an extent of sewerage, considering the flatness of a large portion of the surface of the city. The consequence is that, in many neighbourhoods, yards and cellars are flooded in times of heavy rains or freshets, while in ordinary seasons the waste water from our dwellings and workshops becomes converted, in the gutters, into an offensive mass, of too great density to permit its flowing freely towards the rivers or into the inlets of the sewers, and requiring to be washed out daily by broom and hose. Even much of the sewerage which exists in our city imperfectly fulfils its office of drainage and becomes often, itself, a nuisance of no trifling character. The fault has been that, as the city gradually extended its boundaries with its increase of population, and the need of an extension of underground drainage was in consequence demanded, instead of the few illy constructed sewers, deficient in the necessary grade and dimensions, being replaced by others of an improved plan, of ample capacity and adapted to admit of whatever future extensions should be called for, in too many instances, little else has been done than to put down branches connected with the original sewers, in the construction of which some of the simplest but most important principles in hydraulics have been ignored. We may, it is true, hope that, under the supervision of a Board of Surveyors such as we now have, some part of the evil entailed upon our city by its defective sewerage may be remedied. It is the duty of the Board of Health to aid in effecting an early movement in this direction by calling, from time to time, the attention of our city government to the evil effects upon the comfort and health of the community resulting from the past system of drainage, and the amelioration in regard to it which is the most loudly called for.

The report before us alludes in very general terms to the unwholesome condition of the water furnished by the Kensington reservoir; and, as we presume,

from the impossibility of furnishing a supply of pure water from that source, recommends the entire abandonment of the Kensington works. No notice is taken of the present condition of the water supply from the River Schuylkill, through the works at Fairmount, or the security there is of its continued purity in the future. We believe that, as yet, the water derived from the Schuylkill is well adapted for drinking and all domestic purposes, but there is just cause for fearing that, from causes now in existence and others which are being constantly superadded, its present purity is endangered, and that, if efficient measures are not promptly taken to prevent it, the Fairmount works will, after a few years, have to be abandoned. It is the duty of the Board of Health, as conservators of the public health, to keep a constant and strict eye upon everything calculated to impair the wholesomeness of the Schuylkill water, in order to its prevention, or if this be found impossible, to call the attention of the proper authorities to the necessity of providing in advance a sufficient supply of good water from other sources. The importance of an ample supply of pure water to insure the comfort and health of a large city like Philadelphia can only be fully appreciated when, from any cause, the supply is suspended. Recently developed facts render it extremely probable that some, at least, of the more widely spread and destructive of modern epidemics are propagated by the use of impure water.

Among the hygienic measures most conducive to the health of a community is cleanliness, personal, domestic, and public. Over the first two a Board of Health can exercise no direct influence except by encouraging a sufficient supply of water to every dwelling, and the establishment of bathing facilities for the poor and working classes. Over public cleanliness, however, it must have entire control. It is a perfect farce to intrust to a Board of Health the prevention of disease amid a community, by guarding against the occurrence of its causes, or, when these are present, by their prompt removal, and at the same time deprive it of the power of preventing the streets, lanes, courts, and alleys from becoming the receptacles of decomposable matters, the emanations from which, especially in warm damp weather, are continually poisoning the air of entire neighbourhoods.

To keep the streets and highways and passages of a well-paved city in a sufficiently clean condition would seem to be a very simple thing, and yet, it is one in which the corporate authorities of Philadelphia have completely failed, after expending, annually, in their unavailing efforts to accomplish it, large sums of money. Nothing short of a thorough cleansing of every street, lane, alley, and court, early every morning—from the close of April to the commencement of October—and once a week during the remaining months of the year, excepting, perhaps, when the highways are loaded with ice and snow, nothing less than this, we say, will suffice to secure the health and comfort of the community. To see that this is accomplished is the duty of the Board of Health, or if it be neglected by the department of the city to which it is intrusted, to have it done under the power conferred upon the Board to remove all nuisances prejudicial to the health of the community. While, at the same time, it should insist upon the most stringent regulations being enacted and rigidly enforced, to prevent ashes, dirt, kitchen garbage or any kind of offals or filth from being thrown into the streets at any time or under any pretence.

The same remarks may be made as to the duty and power of the Board of Health in respect to all other things which have a direct tendency to impair the healthfulness of the city. The duty necessarily devolves upon it of preventing the location or continuance within thickly populated districts, of slaughter houses, cow stables, pig-pens, manufactories of an objectionable character, of prohibiting the storage, in such localities, of putrescent materials; and of causing filthy and overcrowded dwellings to be cleansed and their populations reduced. Unless the Board possesses the power referred to, and exercise it with vigilance, it cannot be recognized as the conservator of the public health, inasmuch as some of the more prominent of the domestic sources of disease would be without its control.

The foregoing remarks have been suggested less by what is contained in the report before us, than by what it has failed to notice. We believe that the Board of Health of the City of Philadelphia is as efficient as that, perhaps, of any other

city, nor would we accuse it of any dereliction of duty in wielding the powers intrusted to it for the good of the community. We would merely suggest that a little more fulness and elaboration in its annual reports would contribute much to their interest and value, and do fuller justice to the efforts which the Board has made and is still making to improve permanently the sanitary condition of our city. The remark applies, however, more especially to the general report; we have less fault to find with the report of the Health Officer of the births, marriages, and deaths of 1862, contained in the appendix.

We shall close the present notice with an abstract of the report for 1862 of the Smallpox Hospital, under the charge of Dr. John Bell.

Between the 1st day of January and the beginning of September, 1862, there were received into the hospital, 63 cases of variola, and 61 of varioloid, making together 124 cases. Of the entire number of cases, 62 were in white males, and 40 in white females; 9 in black males, and 13 in black females. Fifteen of the cases were in volunteer soldiers belonging to the army of the United States. Thirty of the cases were received during the month of January; thirty-six in February; thirty-three in March; seventeen in April; twelve in May; three in June; five in July; and one in September.

Thus the increase in the number of cases received into the hospital during the month of December, 1861, noticed in the report of that year, continued during the first quarter of 1862. January of the latter year gave just double the number of cases to those received in the corresponding month of 1861. By the month of March, however, the epidemic had reached its height, and it rapidly declined during the following month, so that in the month of August not a single case was received, and only one in the early part of September.

"This," to use the words of the report, "has been the usual course of previous epidemics of smallpox; beginning in the latter part of summer, increasing in the fall months, reaching its maximum in mid-winter, declining in the spring, and disappearing by mid-summer. The destructive epidemic of 1823–4 pursued this course. In the one which has recently assailed us, the morbid agencies of a predisposing nature, whatever they may have been, were so intense as to have operated without undergoing any modification by season or by atmospherical extremes or modifications."

Of the 124 cases treated in the hospital, 21 terminated fatally, namely, 20 of variola, or 31.74 per cent., and one of varioloid, or 1.64 per cent. Sixteen of the deaths—11 males, 5 females—were in white patients, 5—all females—among the black. The proportionate mortality in the whites of both sexes, was 31.7 per cent. In the males it was 40 per cent., in the females 26.3 per cent. In the blacks of both sexes, the death rate was 23.5 per cent. Divided between the sexes, it was 0 for the males, and 40 per cent. for the females. The proportionate mortality in the two sexes of each color, was the very reverse of what it was in 1861. In the latter year the deaths of white males from variola was 24.33 per cent., while that of the white females was 42 per cent. The deaths among black males was 34.2, while among black females it was only 9 per cent.

Four hundred and sixty-one deaths from smallpox occurred in Philadelphia during 1862, including those in the hospital; showing a decrease in the mortality from the disease in 1861 of 729, or 61.26 per cent.

A correct history of the rise and spread of the variolous epidemic of the two or three past years, would be a document of great interest and value. By throwing light upon the origin of the disease, whether it be the result of a poison introduced in the persons or effects of those coming from abroad, or of some inscrutable, morbific change in the condition of the atmosphere, we should be led to some definite conclusion in respect to the proper plan to be pursued to protect, effectually, the community against its occurrence. But, whether it shall be decided by future investigation that in all cases variola is to be traced to a foreign source, or that it may occasionally result, independently of personal contagion or fomites, from certain morbific conditions of the atmosphere, we feel well convinced that the enforcement of a systematic and thorough vaccination and revaccination of the entire community will be found one of the most certain, if it be not the only certain means of protecting it from the invasion of smallpox.

D. F. C.

Art. XX.—*Address before the Philadelphia County Medical Society. Delivered February* 11, 1863. By Alfred Stillé, M. D., at the close of his official term as President. Published by order of the Society. 8vo. pp. 20.

Among the vast number of addresses annually delivered before the several medical societies and other professional bodies throughout the United States, we occasionally meet with some which exhibit a striking contrast to the mass by their superiority in style, the greater originality in the topics embraced in them, and the ability with which these are discussed. In consequence of the taste and talent such addresses exhibit, they present strong claims to our notice. With these latter is to be ranked the address of Dr. Stillé. It is particularly appropriate to the occasion which called it forth, and descants in correct and elegant language on subjects in which every member of our profession has an interest.

The address commences with a brief notice of the leading objects of the Society before which it was delivered, the general character of its proceedings during the year that had just closed, and the means by which the interest and profitableness of its meetings are to be enhanced in the future, and a fuller attendance of its members secured. Dr. Stillé then refers to some of the leading causes which tend to lower the character of the physician for general learning as well as for sound and adequate professional knowledge. Reference is next made to the importance of medical organization as a means of union among physicians for the establishment and promotion of that fraternal goodwill and hearty co-operation without which our profession would become little better than a horde of ruffians, and the social edifice itself would crumble into the ruins of barbarism. A hasty glance is next taken of some of the requisites necessary to constitute a satisfactory course of public instruction, and the proper means for its successsful prosecution.

These several topics are touched upon rather than developed. They are, nevertheless, handled in a manner so pleasing and withal so particularly suggestive, that we should have been induced to quote somewhat extensively from the author's remarks in respect to them had we not been restrained from a desire to present very fully the interesting remarks of Dr. Stillé on certain of the diseases to which the soldier is liable, and also by the necessity of restricting our notice within reasonable limits.

His connection with one of the large military hospitals in Philadelphia has furnished Dr. Stillé with an opportunity to become familiar with some of the forms of chronic disease most prevalent among soldiers. Of these in the latter part of his address he presents a clear and instructive sketch. The most common by far of the diseases referred to have been affections of the bowels. Commencing as diarrhœas, they assume afterwards more or less of a dysenteric form, and finally, in some cases present an intercurrence of typhoid fever. The patient's health becomes either permanently destroyed, or a very prolonged and vacillating convalescence ensues. Seldom is the patient's health so completely restored as to render a return to active service a prudent measure. Even in the most favourable cases the least excess of fatigue, a change of weather from dry to cold and damp, the slightest over-indulgence in food, particularly if crude and bulky, will endanger a renewal of the characteristic alvine discharges, and render a resumption of dietetic and medicinal treatment imperative. Dr. S. treated this form of disease with tannic acid, given in pilular form, in doses of three grains, with one-twentieth of a grain of sulphate of morphia three or four times a day. At the same time the strictest regulation of the patient's diet was requisite. Dr. S. confined his patients absolutely to bread or soda biscuit and milk. To this strict regimen he attributes whatever success in the cure of the disease he has obtained. Even, however, after the most perfect cures, he remarks, a state of intestinal susceptibility sometimes continues, which by very trifling errors of diet will be converted into active diarrhœa. In some cases the association of lime-water with milk, in the proportion of one-fourth or one-third,

has been manifestly useful. As improvement advanced, rice and farina were added to the patient's dietary. Dr. S. protests against the so-called unfermented bread which is used in some of the military hospitals, as an article of diet for the sick, in consequence of its insipidity, and unsavory and indigestible qualities. As it must be used on the day it is baked it becomes the frequent cause of bowel complaints, and always of their prolongation.

Dr. S. has not noticed ascites to occur in connection with chronic diarrhœa. Distension of the abdomen was occasionally observed; it was always tympanic, and appeared sometimes due to the use of unfermented bread developing a prodigious quantity of gas during digestion. Tympanites, however, he remarks, sometimes occurred unconnected with any apparent intestinal or gastric disorder, or even the least alteration of the general health. Under such circumstances no treatment of it was efficacious.

The most usual systemic complications of diarrhœa were malarial cachexia and scurvy. The first gave to the patient a peculiar sallow or muddy paleness, and seemed to be a common cause of the gastric dyspepsia which so frequently rendered all treatment unavailing, especially in effecting a permanent cure. Whatever periodical phenomena arose were readily subdued by the preparations of cinchona; but these had no influence over the fundamental cachexia. Nor did iron always exert the specific influence which it usually displays in pure anæmia.

"I am inclined to believe," Dr. S. remarks, "that the return of warm weather, and regular and active exercise in the open air will be found the only permanent remedies for this state of impaired health. This is the more likely to be true of those cases, and they are the majority, in which malarial anæmia is maintained by chronic disorder of the bowels. The milder ones, occurring in young men of a robust constitution and previously good health, sometimes recover under the influence of iron and a milk diet; but many more are rebellious to every form of medical treatment."

Dr. S. notices cases in which, along with diarrhœa or even without it as a constant symptom, there is also a scorbutic taint, shown in several instances by œdema of the lower extremities, and ecchymoses of these and other parts; but, as far as was observed by him, without any affection of the teeth and gums. In one case the exacerbations of swelling and discoloration of the legs coincided with an increase of diarrhœa and intense fœtor of the breath. Œdema of the ankles without ecchymotic discoloration was frequent Dr. S. thinks it probable that a scorbutic taint was often present without the characteristic symptoms appearing, and when it was not evidenced by the results of treatment. In the greater number of cases it seemed impossible to carry the improvement beyond a certain point much below the average of good health. But very few of such cases can be expected to recover in the wards of a hospital; they stand pre-eminently in need of fresh air, sunshine, and exercise combined.

"I have believed and urged," remarks Dr. S., "that not a few soldiers who are now permanently invalided, would have been saved to their country's service had appropriate provision been made for their systematic exercise in the open air. The advantages of a rural site for a hospital, which in reality are immense, are thrown away if patients of the classes referred to are not required as well as invited to pass a portion of every day in the fields or the woods, in summer, and during the cold season, in sheds with a southern exposure, where they can be exercised in the drill, or in gymnastic and athletic sports."

Muscular rheumatism is a common complaint of the soldier. The direct causes of the disease surround him at every step of an active campaign. Of the scores of cases seen by Dr. S. there was no one in which the attack began as an acute inflammation. All of them were cases of simple muscular rheumatism, or of subacute or primarily chronic rheumatism of the external ligaments of the joints, and often resulted in muscular atrophy or false anchylosis of the affected limb. In some cases the stiffness of the joints yielded to a diligent and persevering use of active and passive motion. In cases characterized by fugitive pains in different parts of the body Dr. S. believes that cod-liver oil will prove to be the most effectual remedy.

An affection liable to be confounded with muscular rheumatism is intercostal neuralgia. It was noticed in robust soldiers as often as in the infirm. It was characterized by tenderness under pressure of the cutaneous branches of the intercostal nerves on either side of the spinal column, or along the lateral regions of the chest, with aching, burning, or boring sensations in these regions, and sharp lancinating pains running to the front of the chest. This affection was uniformly referred by the patients to the action of the knapsack, either by its contusive blows upon the back in marching, or to the free perspiration it causes in the part, and the subsequent chilling which occurs upon its removal when there is a breeze, or else by getting the back wet with rain or in fording streams. The disease was generally cured by the application of stimulating and narcotic liniments or by superficial vesication.

Palpitation of the heart Dr. S. found to be a common disease among the soldiers, in a form very rarely met with in civil practice. It occurred perhaps in every case of intercostal neuralgia. It often, also, originated apparently from a state of extreme exhaustion, especially when occurring after violent and prolonged muscular efforts.

"Its ordinary association with a frequent pulse, or one rendered so by the erect posture, seems to prove it to be an effect of muscular debility of the heart alone, or of that organ along with the rest of the muscular system. It was not attended with any irregularity of the pulse, nor, ordinarily, with any distinct murmur in the heart—not even with a soft blowing murmur—nor was any such observed in the arteries as an ordinary symptom."

Out of some twenty or thirty cases there was but one in which distinct evidence of organic disease of the heart was discovered, and that consisted of hypertrophy alone.

In this form of palpitation, though it was seldom entirely removed, the improvement generally coincided with the patient's improved nutrition and muscular strength.

"Quite different in its nature from anæmic palpitation, which shows its true character by pallor of the tissues, translucency of the superficial veins, and a rapid improvement under the administration of iron, in this, on the contrary, the complexion and nutrition of the patient were ordinarily good, his appetite normal, his defecation regular, and iron proved to be less useful as a remedy than valerian and digitalis; but all these medicines were less serviceable than rest and time."

The numerous cases of hæmoptysis observed among the soldiers, quite independently of any signs of pulmonary tubercles, appeared to have resulted mainly from direct violence, such as a fall upon the chest, a blow from some missile, as a spent ball, the fragment of a shell, etc., or from compression between two heavy bodies.

"It was surprising," says Dr. S., "that in several cases the hæmoptysis continued long after the general health appeared to have become very good. I should have suspected malingering, had not the physical signs of a former pleuritic adhesion and a complaint of local pain sometimes given colour to the history as originally related. The occurrence of hæmoptysis independently of these cases has been very rare. In the only case of phthisis distinctly made out and terminating fatally, there was no discharge of pure blood from the lungs. Several other cases, it may be mentioned in passing, in which a tuberculous complication of chronic bronchitis was suspected, proved, by their perfect restoration to health, that the suspicion was not well founded." D. F. C.

Art. XXI.—*Clinical Lectures on Diseases of Women.* By J. Y. Simpson, M. D., F. R. S. E., Professor of Midwifery in the University of Edinburgh, etc. etc. Illustrated with one hundred and two engravings on wood. 8vo. pp. 510. Philadelphia: 1863. Blanchard & Lea.

These lectures were delivered by Professor Simpson in his course of clinical instruction at the Royal Infirmary of Edinburgh, and appeared originally in the *London Medical Times* during the years 1859 to 1861, both inclusive. They are now presented by the American publishers in a form more compact and easy of reference than that under which they appeared in England, one through which they will the more readily find their way, as an acceptable addition, into the library of every medical practitioner.

The lectures of Professor Simpson claim our attention, as well from the high professional standing of the lecturer, and the zeal with which he has devoted himself to the especial maladies, surgical and medical, to which the sexual organs of the female are liable, as from the deep interest with which the causation, pathology, and treatment of those diseases are invested. The best instructed and most experienced physician may consult these lectures with profit, while they are adapted to yield a rich harvest of instruction to the younger and comparatively inexperienced members of the profession.

The first two lectures are devoted to the consideration of vesico-vaginal fistula, confessedly one of the most afflicting accidents to which the parturient female is liable, rendering her, too often, loathsome to herself and an object of disgust to all around her, her entire existence being one of complete misery.

Formerly, in consequence of the almost invariable failure of every means that had been devised to afford relief, the accident was looked upon as incurable, and the unfortunate patient was abandoned by her physician as beyond all relief and all hope. Happily, the resources of modern surgery, in their application to the management of the infirmity in question, have been successful in affording very decided relief under even the most discouraging circumstances, and a perfect cure in the great majority of cases.

As the most frequent cause of vesico-vaginal fistula, Professor Simpson classes difficult and prolonged labour, during which inflammation followed by sloughing takes place in the soft parts which have undergone prolonged pressure between the head of the child and bones of the pelvis. He admits that the accident may result, occasionally, from direct injury inflicted by the unskilful use of the forceps. It has been known to result also from long retention of a pessary in the vagina, and to succeed the operation for the removal of a urinary calculus by an incision through the vesico-vaginal septum. Prof. Simpson states that he had under his charge in the Infirmary, some years ago, a very rare case, in which a vesico-uterine fistula ensued from an abscess, which had formed between the uterus and bladder, opening into the cavity of both organs. After some weeks, as the inflammatory deposit was absorbed, the fistulous opening gradually contracted in size, and finally was entirely obliterated.

It is unnecessary to follow the author in his description of the usual situation, extent, and shape of these fistulæ; nor need we stop to notice his remarks in regard to their diagnosis. The presence of the abnormal opening between the bladder and vagina is revealed by symptoms of too striking a character to permit of its being overlooked or confounded with any other diseased condition of those parts. When very minute, its exact location may not at first be very evident in all cases; by the use, however, of a proper speculum the skilful practitioner cannot fail to make it out.

The prognosis in cases of vesico-vaginal fistulæ was, but a few years ago, almost invariably unfavourable; a few cases are reported as having been cured by surgical means, but in the great majority of instances every procedure resorted to for the relief of the patient was alike unavailing.

From a very early period, the obliteration of the abnormal communication between the bladder and vagina was attempted by paring off the edges of the

opening, and then bringing and retaining them in contact by means of silken sutures. This simple operation underwent, in time, a great variety of modifications, which it is unnecessary to notice, as they in no degree prevented its almost invariable failure to effect any decided good, much less a complete and permanent cure. Of late years, however, the operation has been rendered a successful one in nearly every instance by the simple expedient of substituting, for the silk and hemp formerly employed as sutures, silver, iron, lead, or other metallic wire.

Our countryman, Dr. Marion Simms, to whom the credit is, in great measure, if not entirely, due of effecting this important modification in the management of vesico-vaginal fistula, tells us that he operated successively twenty-nine times on one patient, using for sutures threads of hemp or silk, and always without success. In the thirtieth repetition of the operation he made use of metallic sutures, and a cure was promptly effected.

The reason why wire formed of those metals which are the least readily oxidized do not, like thread composed of organic substances, give rise to suppuration and ulceration along their track and in its neighbourhood, Prof. Simpson explains by the fact that the metallic wire in contact with the living tissues remains unchanged, and without exerting upon them any irritating impression.

"If we introduce a metallic wire into a part," remarks Prof. S., "it has no power of absorbing the fluids there, and lies in apposition to the tissues without irritating them. A thread of silk absorbs the fluids thrown out—lymph, or pus, or whatever it might be—and these dead fluids remaining in the thread, and becoming decomposed, render it a small track or nidus of putrefaction and infection."

The material which Prof. S. invariably employs for sutures, and which he believes to be the one best adapted for the purpose, while, at the same time, it is the cheapest, is the ordinary annealed iron wire of the shops, of the size known as No. 32.

For a minute description of the mode of operating, step by step, in cases of vesico-vaginal fistula, we refer our readers to the second of Prof. S.'s lectures in the volume before us.

The succeeding three lectures are devoted to the consideration of one of the most distressing and unmanageable of the diseases incident to the female sex—cancer of the uterus—accordingly as it is seated in the cervix, the body, or the fundus of the organ.

The teachings of the lecturer in respect to the pathology and semeiology of the disease; its anatomical seat and course; its pathological forms; the period of life during which it is most prevalent; its symptoms and diagnosis are sufficiently full, clear, and accurate, while his account of its treatment, as well palliative as surgical or radical, presents in a concise form a very excellent résumé of the views and experience of the most esteemed authorities of Great Britain and Continental Europe.

The existence of cancer in the cervix uteri, which is by far the most frequent seat of the disease, can very generally be made out without much difficulty, by physical diagnosis. When, however, the body or fundus of the uterus becomes the seat of cancer, it is not always readily recognized, and should the cervix be at the same time healthy, which may occur, the true character of the disease may be readily overlooked.

The principal forms under which carcinoma presents itself when its seat is in the body or fundus of the uterus, so far as the observation of the lecturer extends, are the following: 1st. A cancerous deposition in the outer layer of the middle coat of the organ, or in its sub-peritoneal, or peritoneal coat; or, 2d. The cancer may implicate the whole thickness of the uterine walls, without the occurrence of any protrusion or prominence externally or internally; or, 3d. Which is most commonly the case, the cancer may occur in the mucous or submucous coat of the body or fundus, producing cancerous ulceration of the whole interior of the uterus, ending in fatal rupture of the fundus; or, as the lecturer has more frequently seen, assuming the character of an irregular sessile excrescence or fungous mass, projecting into and distending the uterine cavity, or even dilating and passing partially through the healthy though distended os uteri.

Cancer in the uterus, as in every other location, is unfortunately but little under the control of medicine, and only to a very limited extent can it be eradicated by the knife of the surgeon. In the great majority of cases it pursues with certainty its fatal course, with more or less rapidity; death ensuing within a few months, or, at furthest, within two or three years subsequent to the detection of the presence of the disease. In aged persons, it is true, cancer of the uterus will run sometimes a very protracted course, assuming the same slow and sluggish movement which characterizes, in advanced life, all the vital functions and processes.

After passing in review the several means that have been resorted to for the purpose of palliating the more prominent and distressing of the local symptoms of cancer-uteri, Prof. S. discusses the question as to the value of the two surgical operations recommended for the radical cure of the disease—the extirpation of the whole organ, and the removal, simply, of the diseased cervix.

The first of these operations the lecturer considers to be of so hazardous a character as to render it unjustifiable in all cases and under all circumstances. His remarks in respect to the second of the operations referred to are replete with caution and highly judicious. The excision of the cancerous os uteri is attended with much less danger than the removal of the entire organ, and has been occasionally performed with the most decidedly beneficial results. It is applicable, however, to only a very limited number of cases—those in which the cancer is seated in the lips of the cervix, and is strictly limited to the vaginal portion.

After describing the mode of operation when amputation of the cancerous cervix is decided upon, the lecturer points out very clearly the dangers attendant upon the operation. These are, 1st, excessive hemorrhage, of far less frequency, however, since the substitution of the *écraseur* for cutting instruments; 2d, fatal collapse of the system.—We do something, in the opinion of Prof. S., towards the prevention of this alarming and dangerous complication by obviating the necessity of forcibly dragging down the uterus from its position in the pelvis; 3d, wounding the peritoneum, an accident which is especially liable to occur when the *écraseur* is used, and cannot always be avoided by even the most skilful management; 4th, surgical fever and inflammation, accidents liable to occur and destroy the patient after every form of operation where a cutting instrument is employed.

The subject of lecture six is the treatment of carcinoma of the mamma, with especial reference to the removal of the diseased tissues by caustics, as well when the disease is seated in the neck of the uterus.

According to Prof. S., the small number of cases in which the permanent removal of cancer when it occurs in either of these locations can be effected by the knife—the proportion of successful cases not being more than from one to four out of one hundred operated on, affords but slight encouragement for a repetition of the operation. Still, it is to be kept in mind that we can never determine beforehand which of the one, three, or four cases of the hundred is that which will prove the successful one. The happy result has, in some instances, been attained where circumstances appeared to be the most unfavourable—the cancerous tumour having been ascertained by microscopic examination to be of a most decidedly malignant character.

But the operation has been objected to upon other grounds than that of its general failure; thus, it has been asserted upon good authority that unless it be very early performed, before the morbid mass has attained any great degree of development, the operation acts injuriously by weakening the patient and by exciting renewed action at the seat of the cancer, hastening, thus, the progress of the disease, and shortening the life of the patient. The operation, besides, is not without its direct danger. Itself, or its immediate consequences, have, in fact, been the cause, it is stated, of death in one-fifth of the cases in which it was resorted to.

Prof. S. believes that the chance of a favourable result in the treatment of cancer by caustics is much greater than when the knife is employed. Over the latter it has, also, other advantages. Thus, patients who have an almost unconquerable dread of the knife will sometimes be found ready to submit to

the action of caustics. The employment of these has a further advantage over that of the knife, it does not require confinement to bed, nor the same loss of time, and as it requires neither ligatures to arrest bleeding from divided arteries, nor sutures to effect and preserve coaptation of the edges of the wound, consequently all the principal dangers attendant upon the use of the knife are obviated, or, at least, their liability to occur is lessened.

The use of caustic in preference to the knife is further urged from the fact that, while by its action as much of the diseased structure may be removed as by the knife, there is, in addition, the probability that a part of the caustic will be absorbed and infiltrated into the surrounding tissues, so as to destroy or modify the character of any cells which may remain capable of taking on a cancerous type of development.

Formerly caustics were considered applicable only to cancers with open surfaces, and in such where the remedy is permitted to remove the diseased mass layer by layer. But latterly, various methods have been devised—admitting of still further improvement—by which the caustic can be so applied as to destroy the tumour from its centre or base.

After a brief notice of the different caustic substances that have been employed for the destruction of cancerous structures and the manner of their application, Prof. S. expresses his preference for the sulphate of zinc, dried and powdered.

The application of caustics to the cervix uteri is believed by the lecturer to be attended with more danger than to the mamma as the near vicinity of the peritoneum renders it liable to be readily reached and fatally injured. The most manageable of all the strong caustics in reference to the cervix uteri, he considers to be the dried and powdered sulphate of zinc. It may be applied to the seat of the disease, through the speculum, in the dry form, or without a speculum in the form of medicated pessaries, made with as much of the sulphate of zinc as the ointment can be made to take up. The medicated ointment is to be passed, by means of the finger, into the cavity of the existing ulcer, which is to be carefully filled up with two or more pessaries. It may be well, likewise, to introduce into the vagina below, two or three pessaries made with carbonate of soda, to neutralize the zinc should it happen to run down.

Dysmenorrhœa is the subject of the seventh and eighth lectures. This extremely frequent and often intensely painful affection, Prof. S. treats of under the heads, ovarian and uterine dysmenorrhœa, according as the pain has its seat in one or other of these organs. Ovarian dysmenorrhœa is, in the majority of cases, the result of a mere exaggeration of the normally increased hyperæmia and excitability of the ovaries preceding and accompanying the menstrual function. Uterine dysmenorrhœa, the lecturer refers to various morbid conditions of the womb. 1st. The *neuralgic form*. 2d. The *congestive*, dependent upon an exaggeration of the ordinary phenomena of menstruation. 3d. The *inflammatory*, dependent upon inflammation of the cervix uteri. 4th. The *gouty* or *rheumatic*, occurring in patients subject to gout or rheumatism. 5th. Complicated with organic disease or displacement of the uterus. 6th. *Membranous dysmenorrhœa.* 7th. *Obstructive dysmenorrhœa.*

It is somewhat doubtful whether the diagnosis of these several forms of uterine dysmenorrhœa can always be very clearly made out, or that occasionally more than one of the causes to which they are severally referred, may not present themselves in the same case.

Let this be as it may, the account given of the disease by the lecturer, taken entire, is particularly clear and instructive.

The membranous form of dysmenorrhœa, was formerly supposed to be an inflammatory affection giving rise to a fibrinous or plastic effusion upon the interior surface of the uterus, which, at the period of menstruation is thrown off and discharged in the form of a membrane, having the shape and size of the uterine cavity. It is now, however, almost universally conceded that the membrane and shreds of membrane, discharged in certain cases of dysmenorrhœa, are nothing more or less than exfoliations, to a greater or less extent, of the uterine mucous membrane in a hypertrophied condition, such as takes place in the earlier stages of pregnancy. This is proved by examining the membrane

under the microscope, when it will be found to present the complex structure of the mucous tissue, containing crypts or follicles with nucleated cells, and vessels intervening. Virchow tells us that in the examination of the bodies of women who have died whilst suffering from dysmenorrhœa, he has found the mucous membrane of the uterus in a state of partial separation; supplying, thus, a distinct anatomical proof of the doctrine referred to.

In the next three lectures various affections of the vagina, vulva, and labia pudenda are treated—many, it is true, of no very serious import, and yet all of sufficiently frequent occurrence and attended with an amount of distress and annoyance to demand upon the part of every practitioner a perfect familiarity with them—their causes and symptoms—their true character, diagnosis and treatment. Upon each of these points the lectures before us will be found to supply the needed information—clearly expressed, and based upon an amount of personal experience on the part of the lecturer, adapted to give to that information a high degree of reliability.

Among the diseases treated of in these three lectures is the purulent vulvitis of infants and children: An affection which claims the serious attention of the medical practitioner, less, however, on account of its really serious character than because of its importance in a medico-legal point of view. Very often, especially when it occurs in the children of the lower and ignorant classes of society, the disease is imputed by the relatives and friends to a venereal infection. An ignorant and excitable mother will, by threats and by suggestive and leading questions, cause the affrighted child to own to some absurd and groundless tale, in confirmation of her theory of the origin of the malady; in consequence, men have been accused, tried, and even convicted of infecting young children by forcible sexual intercourse, when they were entirely innocent of the crime, and when the disease of the child had a totally different origin.

Like many other local inflammations the predisposition to purulent vulvitis in childhood is very often to be ascribed to some degree of impairment of the general health of the patient from habitual exposure to a damp and impure atmosphere, with bad diet, etc., while its immediate or exciting cause is usually exposure to cold and wet, want of personal cleanliness, the irritation of acrid urine, etc. The disease has been known to attack more than one child in the same family, and to prevail as an endemic, or very circumscribed epidemic, in certain damp, crowded, ill-ventilated and otherwise unhealthy localities.

Purulent vulvitis in young children usually begins with local heat and itching, some degree of redness and swelling, pain and scalding in making water, and sometimes uneasiness in walking. It is not, usually, until the end of the first twelve or twenty-four hours that any discharge takes place from the inflamed surface. The discharge is at first thin and of a mucous character, but soon becomes yellow, or of a yellowish green tint, and purulent. Occasionally it is profuse. Along the outer edges of the external labiæ it is apt to become thick and hardened, gluing the opposed edges slightly together. The disease rarely extends upwards into the vagina or urethra. Occasionally there is, at spots, an appearance of vesicular or pustular eruption; indeed, some type of mucous eruption would probably be found to be a common, if not constant, phenomenon of the disease had we an opportunity of searching for it at an early period of its course. Sometimes, but rarely, there supervene one or two spots of ulceration, especially towards the orifice of the vagina.

Acute infantile vaginitis shows, like other analogous affections, a natural disposition to run through a definite and often short course, with a tendency to cease spontaneously. If not arrested, it sometimes assumes, however, a chronic, protracted form, giving great annoyance and distress to the patient. In its early stage, a dose, or perhaps two, of calomel or gray powder, with a few grains of magnesia, due attention being paid to cleanliness, diet, air and exercise, is sometimes all that is necessary to effect a cure. If the discharge becomes protracted, a course of chalybeates and tonics will become necessary, to bring the constitution and its principal functions as near as possible to the normal standard of health.

In the early or more inflammatory periods of the disease, frequent local ablution with warm water or warm milk and water will be found among the best and

most soothing applications; while sitting in a warm hip-bath during micturition is one of the surest means for relieving the pain and scalding attendant on the passage of the urine; at a later period, when there is much local smarting and pain, a solution of acetate of lead, with acetate of morphia—2 grains of the first and one of the latter to the ounce of water—forms an excellent sedative lotion, or we may use a weak solution of borax or of nitrate of silver. It is a good plan to leave between the labia a slip of lint wet with the sedative lotion. In general, however, better effects will be derived from sedative liniments applied several times a day by means of a brush or feather. In this way we may use cold cream or equal parts of olive oil and lime water. As local applications, liniments are more lasting in their action than lotions, and not so apt to fret or irritate as ointments. Subsequently it will be necessary to resort to local astringents, in connection with or as a substitute for those of a merely sedative character. Tannin, sulphate of zinc, aluminated iron, or any analogous astringent, may be employed in the form of lotion or liniment; care being taken to use them of such strength as to prevent them from exciting such an irritation as to oblige us to again return to the sedative treatment.

An affection is described by Prof. S., of some importance as well from the suffering by which it is generally attended, as from the fact that it is liable to be misunderstood by the young practitioner, and the only means adapted for its cure, in consequence, overlooked. We allude to fissure of the orifice of the vagina, in the form of a linear, irritable ulcer or cleft in the mucous membrane of the os vaginæ, seated almost invariably at its posterior commissure. The fissure of the vaginal orifice is a source of pain when any exercise is taken which causes motion of the part; pain is, in some cases, only felt during defecation or micturition, or when the urine gets into the fissure. Marital intercourse sometimes becomes intensely painful. By the finger there will be detected the existence of a painful point behind and on the posterior aspect of the vaginal orifice; on inspection, the eye discovers in the posterior angle a small red linear ulcer, and, especially when chronic, having rough, slightly elevated, and everted edges.

The most common cause of the disease is the tearing of the perineum which occurs so frequently, to a greater or less extent, in first labors. If this tear heals slowly and imperfectly, the linear form of irritable ulcer which constitutes vaginal fissure is liable to result.

The treatment is very simple and effective: the introduction of two or three fingers to dilate the vaginal orifice and thus tear open the edges of the fissure, so as to convert it into a larger ulcer, which may be healed by the use of cold water or simple lotion. This plan Prof. S. considers preferable to the division of the fissure by the knife.

Lectures 12, 13 and 14 treat of the nature, the etiology and the semeiology of surgical fever—the character of the secondary lesions which result from the disease, with its prophylaxis and curative treatment. These lectures are among the most interesting of the present series. Not only do the author's views of the pathology of the particular form of fever which is liable to occur after surgical operations, and to which is mainly to be attributed the unfavourable results of such operations—especially at certain seasons, and in the crowded, illy ventilated, and badly policed wards of certain hospitals, press themselves with great force upon our attention. They furnish a consistent explanation of all the facts connected with the development of the fever in question, and of the true character of the pathological lesions detected in the course of its careful clinical study, while the very interesting parallelism which Prof. S. has drawn between surgical fever and the more malignant form of the so-called puerperal fever calls for the serious consideration of every practitioner of obstetrics, as well as of physicians generally.

Extensive comparative tables are presented of the lesions most frequently met with in the fever consequent upon various surgical operations, and in puerperal fever, which, so far as the exhibition of facts embraced by them goes, confirm the views of those who, with the lecturer, consider the two diseases as analogous if not identical in their nature and cause. The difference in the frequency with which different internal organs are liable to become the seat of acute inflammatory effusions and changes in the two diseases, respectively, Prof. S.

believes to be mainly, if not entirely owing to the difference in the seat of the primary lesion. But little difference in this respect was found to exist when the more prominent lesions of puerperal fever were compared with those detected in cases of surgical fever following operations or injuries implicating the pelvic organs.

While we very freely admit that the views in respect to the pathology of puerperal fever, so ably set forth by Prof. S., afford a very plausible, perhaps an entirely correct explanation of the nature and mode of production of one and probably a very frequent form of the disease, we still cannot admit that they furnish the key to the etiology of puerperal fever whenever and under all the circumstances it prevails. There is on record a vast accumulation of facts derived from many independent sources which force upon us the conviction that the so-styled puerperal fever, especially when it occurs as an epidemic, is capable of being produced by some unknown atmospheric poison. The influence of which poison is not confined exclusively to puerperal women—notwithstanding we may admit their greater predisposition—but is experienced, to a greater or less extent, by nearly all who come within the sphere of its action, whether male or female.

The suggestions contained in the following extract from lecture 14 is deserving of serious consideration on the part of both surgeon and accoucheur.

"Surgeons have hitherto scarcely, or indeed not at all, attended to a kind of prophylactic which ought to be to them of great importance, provided surgical fever is so analogous as I believe it to be to puerperal fever, as to be capable of being propagated by similar means. Almost all English accoucheurs believe that occasionally puerperal fever is liable to be communicated by the medium of the medical practitioner from a patient already attacked to a person in labour, it being spread from the diseased to the healthy by the accidental inoculation into the latter of morbid inflammatory secretions thrown out in the course of the disease in the body of the former. The evidence of the truth of this fact, as far as regards the communicability of puerperal fever, is, I think, quite overwhelming to any unprejudiced mind, and the neglect and defiance of it are constantly leading to unnecessary because avoidable mortality, particularly in the practice of continental obstetric hospitals. Do the surgeon or his attendants after handling the wounds of patients labouring under surgical fever, or coming in contact wtth their discharges, and any zymotic poison or poisons contained in them, and immediately afterwards touching recent surgical wounds in new patients, ever inoculate into these wounds a zymotic poison capable of stirring up surgical fever in the new surgical patient, supposing he is otherwise predisposed to an attack of the disease? I believe that surgical fever is often enough propagated in this way, just as puerperal fever is. Surgeons will tell you that they have occasional runs of bad luck among those upon whom they operate. In other words, they have surgical fever occasionally in their practice, and are spreading it from patient to patient; and ought, under these circumstances, to do what I once heard of a distinguished English surgeon doing, viz., locking up his knives for some weeks. They should, like the accoucheur, under similar circumstances, suspend their practice for a time. Perhaps surgical fever is spread in this way in hospitals by surgeons themselves, by dressers and nurses, to a degree that at present is not yet dreamed of."

In Lectures 15 and 16, Prof. S. discusses the pathology and treatment of Phlegmasia Dolens. He objects to the doctrine advanced by Dr. Davis, and adopted by nearly all subsequent writers, which attributes the production of phlegmasia dolens to an obstruction to the passage of the blood through the principal vein of the affected limb, from an obliteration of its canal caused by an attack of phlebitis. He adduces a series of observations which go to prove that obstruction of the femoral vein is insufficient of itself to give rise to the characteristic phenomena of phlegmasia dolens; and that the latter may even occur while that vein remains entirely pervious. Prof. S. believes with several recent observers, that in order to give rise, not simply to the œdema, but also to the heat, swelling, tension and paralysis characteristic of the disease in question, there must take place a consolidation of blood in the entire ramification of vessels which coalesce to form the tributaries of the femoral vein: the resulting

disease being in proportion to the number of the vessels in which this consolidation occurs.

From the experiments and observations of Dr. Mackenzie, it seems probable that the coagulation of the blood in the branches and ramifications of the crural vein is due to the presence in the blood of a morbid matter through which such an influence is exerted on the internal surface of the veins as to lead to a consolidation of the blood they contain; the blood of the puerperal female, it may be remarked, being, from various causes, always so altered as to render it peculiarly liable to spontaneous coagulation within the vessels, assuming a state of thrombosis, as it has been termed, with all its consequences.

"Modern pathology," remarks the lecturer, "teaches us that, in the first instance at least, this venous coagulation, consolidation, or thrombosis, may arise without any previous inflammation of the veins, which at first are simply obstructed and occluded by the plug of consolidated blood. If the internal coats of the veins are found with evidences of inflammatory changes after death, these changes may in general be correctly regarded as secondary phenomena, and the inflammation of the venous walls which led to them as a secondary result, produced by the irritation and pressure of the contained thrombosis, and by the changes which take place in the obstructing mass. So that, if this doctrine be true, phlegmasia dolens does not arise from phlebitis properly so-called, but is immediately due to obstruction of the veins by coagulated blood, and any resulting phlebitis is a secondary consequence only. This coagulation of the blood and obstruction of the veins may, in their turn, depend on one or other of two causes, viz: either, first, on some morbid alteration in the blood itself, tending to its consolidation or coagulation, or, second, on some morbid condition in the lining membrane of the veins, in virtue of which the relation between the bloodvessels and the blood becomes disturbed, and coagulation of the latter is induced. I believe that in some cases of phlegmasia dolens this required morbid condition in the lining membrane of the veins may be primarily due to phlebitis, as where the veins of the uterus have been inflamed, and the inflammation having extended, by continuity, to the iliac vessels has led to coagulation of blood in the veins below. But in the great majority of cases it seems to me that we must look for the primary cause of the disease in some morbid condition of the circulating fluid, leading first of all, perhaps, to some peculiar change in the lining membrane of the veins, and through this, secondarily, to coagulation of the blood, occlusion of the vessels, and obstruction to the circulation in the limb."

The general indications of cure as laid down by the lecturer are: 1st, depuration of the blood by the use of emetics, when not contraindicated by the condition of the patient, diaphoretics, and purgatives in the early stage of the disease, and not pushed so far as to produce any very debilitating effects. 2d. In the commencement of some few cases when the pulse is high and strong, and general symptoms of fever prevail, the use of antiphlogistics and febrifuges may be indicated. They must always be used with great caution and never to any heroic degree. 3d. From an early period of the disease, in some asthenic cases from its very onset, indeed, tonics and stimulants will be demanded. Wine and the preparations of iron and quinine are among the best, especially in the second stage of the disease. The local indications are: 1st, the use of local antiphlogistics. These should, perhaps, be reserved for cases in which secondary phlebitis ensues. To relieve pain, opiates should be freely given internally, and the affected limb enveloped in a wet towel or a sheet of dry cotton wadding, carefully and completely covered with oil cloth, to prevent the escape of the insensible perspiration. Sedative liniments sometimes afford great relief—such as olive oil and laudanum in equal parts, or two parts of oil and one of chloroform, or the officinal opiate liniment. Rest and elevation of the limb are to be enjoined. The best and most steady position of the limb is obtained by placing it on an inclined plane formed by raising the lower half of the mattress by inserting some convenient body beneath it. 2d. Absorption is to be promoted by a flannel bandage applied pretty tightly to the limb from the toes upwards, frequent frictions, the use of stimulating liniments, and the occasional application of a small fly blister to the groin. 3d. When the swelling has been

reduced, an effort is to be made to restore power to the limb. This is to be done by perseverance in the use of frictions, bandages, and warm douches. Sea bathing will often do good—local stimulants, such as galvanism, may be tried—and the natural use of the limb in the exercise of walking commenced as early as it can be done with safety.

In the seventeenth lecture Prof. S. treats of a very annoying disease, and which is not unfrequently attended with intense suffering, the true nature of which has only very recently been satisfactorily made out. To indicate its seat and most prominent symptom, the lecturer proposes to name it *coccyodynia*.

The leading symptom of the disease is pain in the region of the coccyx, experienced by the patient whenever she sits down or rises up, and sometimes while she continues seated. Occasionally, the pain is felt in walking, and during defecation. It differs in intensity in different cases and at different periods. The distinguishing feature of the disease in every case is pain at the lowest point of the spine, or rather in the site of the coccyx where, when pressure is applied, the pain is always aggravated.

The disease is evidently caused by the action of the muscles inserted in a coccyx the articulations of which have been rendered morbidly sensitive from some injury they have received or by inflammation or other diseased condition of them or of the surrounding fibrous tissues.

Constitutional remedies are of little avail in the treatment of this affection. Occasionally relief is obtained from leeches applied over the seat of the disease, and followed by counter irritation, while the patient is kept at rest, and placed, at the same time, under a general antiphlogistic treatment. The only certain means of securing entire and permanent relief to the patient is the complete separation, by the knife, from the coccyx of all the muscular and tendinous fibres in connection with it. For the manner of performing the operation we refer to the lecture before us.

The next subject treated of (Lectures 18, 19) is pelvic cellulitis; a disease of great importance, from the frequency with which it is met with in practice, and the mischief to which it may give rise if overlooked or mismanaged in its earlier stages. For our knowledge of its true pathology we are almost exclusively indebted to very recent investigators. It is, strictly speaking, an inflammation of some portion or all of the cellular tissue of the pelvic cavity, and which may give rise to an effusion of serum, pus, or coagulable lymph, or to a sloughing of the inflamed tissue.

Though often a tedious and troublesome disease, it is seldom a very fatal one. When, however, it has terminated in suppuration and an abscess forms, a fatal result may ensue by the bursting of the abscess into the cavity of the peritoneum exciting peritonitis; or the cavity of the abscess, after it has burst and the pus has found its way externally, may not close up, but continue to discharge a purulent matter, and if the sinuses formed are of considerable extent and the discharge copious, the patient may sink finally under the long-continued drain; and, finally, in a few cases, after subsiding for a time, the disease has been found to return again, and become gradually established in a chronic form; the patient dying finally of tubercular peritonitis. In such cases the patients, no doubt, were of a tuberculous diathesis—the cause, however, of the development of tubercular disease in the peritoneum was, there can be but little doubt, the irritation so long kept up in the pelvic cavity by the subacute cellulitis.

For a very full and able account of the pathological anatomy, symptoms and diagnosis of pelvic cellulitis, and its proper management before and after suppuration has been established, we refer to the lectures of Prof. S. Their attentive study will afford ample compensation for the time devoted to the task.

In the 20th lecture, Prof. S. gives a very full, clear, and able account of periuterine or pelvic haematoma, or the effusion of blood which occasionally takes place into the tissue filling up the angles and spaces between the layers of the pelvic fascia. It is of less frequent occurrence than the affection last described, and less understood, while it is more fatal. It is only lately that the attention of pathologists have been directed to the investigation of its true character and causes. In relation to the latter of these questions there still exists much difference of opinion. Prof. S. believes that it is produced by a rupture of one of

the veins or arteries—sometimes in a varicose state—that supply the ovary and pass to it between the layers of the broad ligament. Occasionally, however, he admits that the pelvic hæmatoma has a different source and site. The tumour produced by the infiltration and accumulation of blood in pelvic cellular tissue, differs in size and shape according to the amount of blood poured out and the part into which it escapes.

For the symptoms attendant upon the disease, its usual course, the indications for its treatment, and the means by which those indications are to be carried out, the reader is referred to the lecture before us.

*Spurious pregnancy* is the subject of the next two lectures. The curious condition of things which has often led to the belief on the part of the patient and her friends that pregnancy exists, when there is no fœtus present in the uterus, may result from either local or constitutional causes. This, in certain cases of dysmenorrhœa, where the patient has occasionally, or perhaps at each menstrual period, an excessive development of the uterine mucous membrane, which is in part cast off in the form of a distinct production, resembling in all respects the decidual membrane of pregnancy, besides the expulsive pains which attend the discharge from the womb of these uterine casts, the patients may be affected, also, with some of the ordinary and constitutional and sympathetic phenomena of pregnancy. Such as sickness and vomiting, enlargement of the mammæ and darkening of the areolæ, observed some one or two weeks before and after the expulsion of the uterine cast referred to. The more frequent form of spurious pregnancy, however, is that in which all the more striking phenomena are of constitutional origin without any appreciable local change. There are nausea and vomiting, enlargement of the mammæ, darkened areolæ, and a milk-like secretion. The abdomen enlarges gradually until, occasionally, it assumes a form and size as though it were occupied by a gravid uterus, and movements are felt by the patient simulating those of a living fœtus. The menses are occasionally suspended or irregular and scanty. These phenomena may go on progressively for a period of nine months or until symptoms, as may happen, resembling those of labour set in; and it may be the case that it is not until the accoucheur is sent for that the patient discovers that she has never been pregnant.

This constitutional form of spurious pregnancy the lecturer believes may depend in some way upon the changes which occur in the ovaries and the uterus at the period of menstruation.

"When the irritation associated with the normal or physiological changes in these organs is somewhat excessive either in degree or duration, and is repeated from month to month, the sympathetic phenomena excited at one period have not, in some instances, had time to subside before a new stimulus is supplied for their continuance by the recurrence of the menstrual molimen. True pregnancy occurs when the ovulum which escapes from the Graafian vesicle duly meets, within the mother's body, with male spermatozoa, and, as a consequence, a long nine months series of local and constitutional phenomena immediately begins to be set up. But the same series of constitutional phenomena, at least, is set up in cases of pseudo-cyesis when an ovulum escapes, or a reproductive nisis occurs, without any male spermatozoa being present; these phenomena occasionally ending, as we have seen, at the usual extreme term of utero-gestation, in a simulated parturition."

False pregnancy may, it is true, be sometimes found associated with, and perhaps its phenomena continued and exaggerated by the most dissimilar forms of uterine or ovarian disease, but no such association necessarily or very frequently exists; so that the disease would seem to be dependent rather upon some disturbance of the ordinary function of the generative organs than to any organic disease of these organs attended and attested by material changes in their intimate anatomical structure.

Lectures 23 to 30 inclusive are devoted to a very full account of the more common forms of ovarian disease, and an examination of the several plans proposed for its cure—the question in respect to the value and propriety of ovariotomy—the cases to which the operation is adapted and the results of its employment. The whole subject is treated by Prof. S. at great length, and with perfect

candor and unquestionable ability. We must pass by these lectures, however, without further notice: not that we would in any degree underrate the importance of the subjects discussed, or the value of the lecturer's observations, whether pathological or practical, in respect to them, but because in another part of the journal our readers will find a more full and complete review of the received views in respect to the pathology of ovarian disease and its treatment than we could hope to furnish, in a commentary upon the lectures of Prof. S., comprised within the narrow limits to which we are necessarily restricted, even were our personal experience in the management of these diseases far greater than it actually is.

We shall be obliged also to pass by without comment the subject of the thirty-first lecture, in which we have a description of cranioclasm; an operation introduced by the lecturer for breaking in pieces the bones of the fœtal head, and in this manner reducing its size and altering its shape so as to permit of its passage through a very contracted pelvis. The operation of cranioclasm, that is to say, of skull crushing, may be substituted, the lecturer believes, with great advantage, for those of crainotomy and cephalotripsy, in those rare cases of parturition in which it is deemed necessary to have recourse to some means of diminishing the bulk of the fœtal head with the view of terminating the labour with safety to the mother, a result which appears to be in any other way impracticable. He is convinced that the new operation will be found to be, at once, safer for the mother and more easy for the practitioner than either of the two dangerous forms of operative procedure it is intended to supersede. It would scarcely be possible by any mere description, unaccompanied by the drawings, by which the lecture on cranioclasm is illustrated, to give an accurate idea of the operation.

An interesting lecture follows on some of the more prominent affections of the Fallopian tubes. The most frequent, perhaps, and certainly the most important of these affections, is dropsy—of which a highly satisfactory account is given by Prof. S. The operation he recommends for the cure of this form of dropsy, after its existence has been very certainly made out, is at once easy, simple, and comparatively safe. It consists in puncturing the cyst in which the fluid is contained with an exploring needle, introduced through the roof of the vagina; the fluid being allowed to escape by draining slowly through the tube of the instrument. By this procedure there is caused either an obliteration of the sac or such a change in its lining membrane as will prevent it thereafter from furnishing the dropsical fluid by which it had been distended.

Lecture thirty-three treats of a disease of which the causes and pathological nature are by no means well understood: we allude to puerperal mania, or that mental disturbance which occasionally occurs during the puerperal state, at some period, usually between delivery and the termination of lactation. It is often found to be associated with a hereditary tendency to insanity. The usually received views in respect to the nature and etiology of the disease will be found to be very fully discussed by the lecturer, while the account given by him of the treatment which experience has shown to be the most successful in restoring the mind to its wonted sanity is full, clear, and satisfactory.

The subjects treated of in the four remaining lectures, are particularly interesting. The young practitioner will find more than one of them but slightly alluded to, if noticed at all, in the received practical treatises on the diseases of women. The affections to which we have reference are sub-involution of the womb after delivery, super-involution of the womb, and amenorrhœa. The latter can, in no case, perhaps, be considered as of itself a disease, being invariably a mere symptom of some passing disturbance of function in the organs to the action of which the menstrual flux is due or to their permanent organic lesion. Following in the steps of previous teachers of the gynæcia, Prof. S. treats of amenorrhœa in reference to its semeiology, and symptomatology, while he describes its treatment, under the heads of symptomatic, constitutional, specific, and local; with a few words in conclusion on amenorrhœa connected with undersized uterus.

If, as we believe, the arrest of the catamenial flow is invariably dependent upon ovarian or other disease, it must be evident that the only rational and successful

means of effecting the re-establishment of the flow is the removal of the disease to which its stoppage is due, and that all remedies used for the specific purpose of bringing on the flow without reference to the condition of the organs concerned must necessarily fail in producing the desired result. We are pleased to find the lecturer expressing his doubt of the action of any drug or combination of drugs as a specific emmenagogue. The good effect of most of the reputed emmenagogues is, no doubt, due to their invigorating influence upon the general system of the patient. Whatever may be, however, their *modus operandi*, some of them have so often proved useful in practice that, as Prof. S. remarks, the physician will feel himself, in nearly every case, bound to make full trial of them before having recourse to any more direct local remedies. Even after it has been found necessary to resort to the latter, he thinks that their use may, with propriety, be still continued.

The lecturer's account of amenorrhœa and the treatment demanded in the several morbid conditions under which it occurs, is well worthy of a careful perusal.

Our desire has been in our notice of this volume, to direct the attention of our readers to the character of its contents, in the hope of attaining for it a place in their respective libraries. We are persuaded that they will find it a ready and faithful guide in facilitating their investigation of the nature of some of the most common and serious of woman's ailments, and an admirable exponent of the most approved views in respect to their therapeutics—compared with and enforced by a comparison with the author's own ample experience as to their most successful management. D. F. C.

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ART. XXII.—*Chemistry.* By WILLIAM THOMAS BRANDE, D. C. L., F. R. S. L. & E., and ALFRED SWAYNE TAYLOR, M. D., F. R. S. Philadelphia: Blanchard & Lea, 1863. 8vo. pp. 696.

THE constant advance of chemical science seems to entail upon its teachers the necessity of frequently placing before its students new expositions of the theories and facts as guides to its study. The names connected with the work before us, the former the well known author of the *Manual of Chemistry* which has passed through at least six editions, and the latter the leading medical jurist of England, are sufficient to claim for it immediate recognition and welcome reception. Prepared expressly for medical students and the general reader, the intention has been to provide an introduction to the science of chemistry, which should be adapted to all classes, and comprise a selection of the more important facts and theoretical views of the modern science, expressed in the language most generally adopted in the schools and colleges in which this department of knowledge is taught. It is certainly desirable that chemistry should be considered as one of the fundamental branches in which the physician and pharmaceutist should not only be well instructed in their preliminary studies, but with which they should likewise be induced to keep up, in that limited extent which a correct appreciation of the value of the science to physiology, materia medica and pharmacy, demands. Unfortunately while the lectures on chemistry are, from their experimental character, very attractive and interesting, they do not always invoke a desire to obtain such a clear insight into the subject which can only be obtained by mastering at the commencement those technicalities which are unavoidable in any exact science, but which, when once overcome, not only render the way clear, but assist materially in its comprehension and remembrance. Many of our text-books are of such a character that, although they give a very clear and ample exposition of the science, yet deal so sparely in the useful applications, that the practical mind does not receive an adequate response to its "cui bono" inquiry, nor can they be used as works of reference in those common cases in which physicians and pharmaceutists and the general reader are so frequently desirous of satisfactory information. This end is ade-

quately attained in this work, in some instances by ample detail, in others by incidental mention sufficient for the purpose in view. Thus while the general means by which each particular poison may be distinguished, are fully treated of, in a special instance, one very common and highly injurious, that of arsenic green in wall paper, the most ready mode of detection is so clearly described that but little chemical knowledge is required for its practice.

The work is comprised in four parts. The first treats of matter and its properties, under the general relations of the physical forces, crystallization, affinity —equivalents, nomenclature, and notation. Those departments of physics which are usually found in this portion of the text-books, caloric, &c., are not included as distinct subjects of study, but sufficient for the purposes is introduced incidentally in appropriate places to render the absence of special consideration of no disadvantage. The second part contains the account of the metalliods or non-metallic elements, and here the importance of this division is shown by the more elaborate detail in the explanation of processes, properties, and applications. The aim of the author being "directed to the elucidation of the most important facts and principles, omitting altogether those details which are either of a controversial nature or not yet established on a satisfactory basis." It may here be remarked, that in the first part when speaking of the constitution of salts, the theory which considers them as composed of acids and bases is adopted, and in the American edition, which has received additions from one of the authors, it is advocated to a greater extent than in the original work. It is in this portion that we miss the illustrations, which have of late become so common in the text-books of science. Those which are useful to the beginner, especially if absent from large cities, would take up space which is otherwise better occupied in a work intended either as a text-book in following a course of lectures or for the use of more advanced students, and their want can be readily supplied in the works on practical chemistry which are now attainable. The third part gives a condensed view of the metals and their principal combination, considered in all their ordinary relations so as to be consulted by persons with diverse view, without disappointment.

The last part is devoted to organic chemistry. This department of the science has latterly progressed with such rapid strides that it requires no little amount of moral courage even to undertake the labour of giving a condensed exposition of its present condition, and it is hardly a matter of surprise, therefore, that this part should be less complete and satisfactory than the previous ones. At the same time it must be admitted that the subjects are treated in the same clear and practical manner, and the amount of new information is equal in proportion to that contained in the former portions. We feel confident that this work will recommend itself to all for whom it is intended, not only to study for a time, but to be placed on the shelf as a work of frequent reference.

R. B.

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ART. XXIII.—*Researches upon the Anatomy and Physiology of Respiration in the Chelonia.* By S. WEIR MITCHELL, M. D., and GEORGE R. MOREHOUSE, M. D. Washington City: Published by the Smithsonian Institution, April, 1863. 4to. pp. 39. Illustrated with 8 wood-cuts.

IN this admirable monograph we recognize another important step in the onward march of physiological research. A long-accepted error is herein exposed and rectified, and new landmarks of facts, concerning both structure and function, are set up as guides for future investigators. The facts are the more valuable inasmuch as they aid materially in forming in the abstract a true conception of the respiratory function—that mainspring of all the complicated acts which collectively constitute organic life.

The object of this memoir is to show that turtles, unlike the frogs, do not inspire by an act of deglutition, but that their respiration is effected by inspiratory and expiratory muscles situated within the trunk.

The opening pages are devoted to a brief account of the anatomical history of the organs of respiration in Chelonians. The earliest work upon this subject, noticed by our authors, is a "Dissertation on the Respiration of the Tortoise," by Robert Townson, LL. D., written at Göttingen in May, 1795. This is a short but highly interesting tract; and as it contains a brief review of all that was previously known upon the subject of Chelonian respiration, it has been republished entire in the essay under notice. This procedure was adopted as an act of justice, moreover, to the singularly truthful views of Townson, which are but little known, and where known are either unappreciated or condemned as erroneous. From this brochure we derive the following facts.

In the frog-tribe, as is well known, the absence of ribs and a diaphragm necessitates a departure from the mammalian type of respiration. In the turtles the diaphragm is absent also, while the bones of the trunk are quite immobile. Blasius, indeed, asserted the existence of the diaphragm, but Gotwald, Wallbaum, and the French academicians were unable to find it. Townson also sought for it in vain. In consequence of this deficiency of the requisite mechanism for respiration Perault was led to attribute the expansion of the lungs and consequent inspiration to the elasticity of the membranes forming their cells; and the expiration to muscular compression. Varnier thought that the process of respiration was effected by the muscular texture of the lungs themselves. Tauvry and Haro maintained that turtles breathed only while walking. Townson by two simple and conclusive experiments showed the fallacy of this opinion. Morgagni supposed that the tortoise respired like the frog, and in this opinion he was supported by some observations of Coiter and Varnier. Townson combats this idea with vigour, and gives us the following explanation :—

"My attention was soon called to observe the structure and office of some muscles in the region of the flanks, which I observed often to be in motion, contracting and extending alternately, and though placed by the side of the hind legs, these were not moved by them. Further, they were placed at the end of the last lobule of the lungs, and they appeared to retain their irritability the longest. This was sufficient to lead me to conjecture that these might be the parts by which respiration in these animals was performed; and to see them act in their natural position I sawed off, in another tortoise, that part of the shell which covers them, and I then saw them constantly working. One was now placed nearly in a perpendicular direction, and another, or part of the same, was placed nearer the sternum, lying almost in a horizontal direction. The first in its contraction, receded from the testa inwards, whilst the latter, in its contraction, observed a contrary direction. When I attributed to them the office of expirator and inspirator muscles, which I supposed them to perform, I was embarrassed, because I could not conceive how a muscle could be a constrictor with its convex side; yet when the expirator, by contracting, had receded from the shell inwards, it appeared, when viewed from without, to be concave. But this difficulty ceased as soon as I had opened the animal and dissected the parts, for I then found the following admirable contrivance of nature. This part is composed of two distinct muscles, with their risings and insertions quite different, yet firmly connected in the middle by cellular membrane. The first rises from the testa near the spina dorsi, and is inserted into the peritoneum; this is the constrictor of the lungs, or the muscle of expiration. The other is nearly spread over the whole cavity between the upper and under shell, where the hind legs are drawn in during the contracted state of the animal, being inserted into the margin of the testa above, and the margin of the sternum below. The places of insertion of these muscles, and their connection in the middle being known, there is then no difficulty in explaining why the muscle, while acting as a constrictor, appeared concave, as it was only the inspirator brought into that position by its antagonist; nor any difficulty in conceiving how they carry on the function of respiration; for the expirator being connected, as I have already said, to the testa below and to the peritoneum above, envelops in a manner the last movable lobule of the lungs; when, therefore, it contracts, it compresses this part of the lungs, and by that means expels the air; then ceasing to act, the other contracts, and draws the former with it, thus a vacuum is formed, into which the air rushes, as in the respiration of those animals which have a thorax.

"To prove that this explanation was well founded, and that the motions of these muscles were really those of respiration, I made the following experiment. I fastened on the nose of a tortoise a little valve made of white paper, which covered the nostrils, and with the assistance of a friend, I watched the motions of the soft parts lying within the hollow where the hind legs came out, and I found that these motions perfectly corresponded with the motions of the valve, which was put into motion by the expirations and inspirations of the animal. In this manner I conceive respiration to be carried on in the tortoise, without, however, meaning to extend this explanation to the whole of the genus Testudo, some families of which I have never yet had an opportunity to examine. These animals will therefore materially differ from those of the two preceding families in the mode of respiring; the air in them being driven into the lungs by the muscles of the throat, which act like a pair of bellows, whilst in these it is performed by the lungs following the motions of their containing parts, and they will therefore differ from the animals having a thorax chiefly in the form and situation of the parts."

In 1819 Bojanus published an important work on the anatomy of Testudo Europææ, in which the inspiratory muscle and the posterior belly of the expiratory muscle are grouped as abdominal muscles. In his *Leçons d'Anatomie Comparée*, Cuvier asserts that inspiration is effected by the alternate contraction and dilatation of the throat, which are movements of deglutition. According to Duneril and Bibron, air enters the buccal cavity through the nose, then the fleshy tongue is applied to the posterior nares so as to close them, and the mylohyoid floor of the mouth contracts to force the imprisoned air into the lungs.

As long ago as 1719 Malpighi and his contemporaries described the respiration of turtles as similar to that of frogs. Muller, Carpenter, T. Rymer Jones, Milne Edwards, Agassiz and others have, one after the other, reiterated this opinion.

From the paper under consideration we learn that—

"In the summer of 1861, Dr. Weir Mitchell, while engaged in studying the blood-pressure in the snapping turtle, Chelydra serpentina, became convinced that the prevailing views as to the respiratory mechanism of Chelonian reptiles were totally incorrect. Accordingly he partially studied the subject, and incidentally embodied his opinions in an essay upon the blood-pressure in the snapping turtle. At the time referred to, Dr. Mitchell was unacquainted with Townson's researches. The views of Dr. Mitchell, and the experiments by which he supported them, will be found scattered through the text of the present essay, of which, indeed, they form the basis. In the summer of 1862, the present authors took up anew the study of the respiration in turtles, and have endeavoured to render it as complete as possible. In so doing they have been fortunate enough to carry the subject far beyond the crude experiments of Townson, and to discover anatomical and physiological facts of the utmost interest and novelty, which have hitherto escaped attention."

Our limited space will not permit an extended account of the experiments and observations of Drs. Mitchell and Morehouse. While we refer our readers to the paper itself for many interesting details, we must content ourselves with furnishing in this place a résumé of the more important results arrived at.

The physiological portion of the essay treats of, 1st, the externally visible phenomena of respiration; 2d, the physiology of the muscles of respiration; and 3d, the physiology of the respiratory nerves.

The respiratory process is thus described:—

"Turtles breathe easily with the mouth open or shut. This fact alone deprives their respiration of all resemblance to that of Batrachians.

"The respiratory process is threefold, and consists of—

"1. Complete expiration.

"2. Complete and very full inspiration.

"3. An appearance of slight, or partial expiration, followed by a pause of greater or less duration.

"During the period which precedes this series of movements, the turtle being at rest, the spaces between the posterior members and the plastron and carapace are nearly level, or only a little concave. The shoulders are pushed forward somewhat, the lungs being full at this time, while the large hyoid apparatus is

usually dilated or drawn backwards and downwards. Sometimes it is in continual motion, like that of the frog when breathing, but in the turtle this rise and fall of the hyoid arches has no essential connection with that function. When, during the inter-respiratory pause, we open the jaws, the same movements of the hyoid apparatus may still be seen, nor is it easy at these times to assign to them any very obvious purpose. The glottis may be seen at rest, as a linear slit, in the centre of an ovoidal slightly elevated mound, just back of the tongue, on the floor of the mouth. The first respiratory act is one of expiration. Whether the mouth be opened for observation or not, the following movements occur: The hyoid apparatus descends and broadens laterally especially at its posterior part, carrying the glottis back and a little down. The object of this action we suppose to be, the separation of the glottis from contact with the roof of the mouth, in order that the air may the more readily enter it after passing through the nares. At the moment of beginning to expire the glottis opens wide, so as to form a rhombic figure. It remains thus until the whole respiratory act is completed. Meanwhile, during expiration the limbs fall in towards the shell quite passively, and the flank spaces in front of the posterior limbs sink so as to present deeply concave surfaces.

"A full inspiration instantly follows. The flank spaces become flat and tense, rising to a level. The glottis remains open. The hyoid arches advance, and at the close of the inspiration the shoulders are pushed passively forward.

"As soon as the lungs are completely filled, a very slight expiration relieves them of the surplus air, the flank spaces sinking a little, the hyoid arch at rest, the glottis closing at the end of the expiration. The final action here described appears to be due to the cessation of activity on the part of the inspiratory muscles and to the passive falling in of the limbs displaced during their contraction. The lungs are thus left full of air, and ready for the next act of respiration. Whenever a turtle in air breathes, these triple actions occur, but when under water it occasionally expires air, and does not rise to renew the supply until some time has passed by."

In the following extract will be found the explanation, given by our authors, of the function of the respiratory muscles of the turtle:—

"A large snapping turtle was secured on its back, and an incision made over the flank space, between the posterior limb and the plastron and carapace. The skin and superficial fascia were then carefully removed so as to expose the whole muscle which fills this space, and which has already been fully described.

"When inspiration took place, the muscle contracted, and as it is possessed of a central tendon from which radiate fibres in all directions, the result of their shortening was to convert its previous deeply concave surface into one which was nearly level, while at the same time the air rushed through the open glottis into the lung. The analogy between this muscle and the diaphragm of mammals was absolutely perfect. The central tendon, the converging muscular fibres, and the form of movement resulting from this beautiful arrangement, all united to suggest the resemblance. The inspiratory function of this muscle was palpably evident, nor could any other office be possibly assigned to it, because it was attached to no movable bone or other parts susceptible of motion.

"Repeated galvanization of this muscle served further to demonstrate its purpose. Finally, the muscles on both sides were removed, when all inspiratory power was lost. The turtle could empty its lungs, but possessed no power to fill them anew.

"The muscles engaged in expiration were next made the subject of study. At first we were led to believe, that the elastic contractility of the lungs might alone suffice to empty them, but this was opposed to all physiological analogy, and the power with which expiration occurred was too great to allow us to suppose that no muscular force intervened for its production.

"To examine this part of the subject, a turtle (snapper) was secured, as usual, and the plastron removed, with the exception of a rim at the back and on each side, to which remained attached the fibres of the inspiratory muscles. After a few minutes the turtle expired the air in the lung. During this action, the fascia covering the lungs below, and lying between the peritoneum and the plastron, was observed to become tense, owing to the contraction of the two

sheets of muscle, which terminate this tendon anteriorly and posteriorly, and find origin in the carapace.

"Recalling the full anatomical description already given, it will be remembered, that the lungs and abdominal viscera are covered outside of, and below the peritoneal sac, by a white membranous tendon, which extends across the middle line, and is firmly attached to the pericardium, as well as by firm areolar tissue to the central line of the plastron or lower shell. The muscular bellies arising from this covering tendon, fold over the lung in front and behind. Opposite to the inspiratory muscles are also areolar fibres, binding its tendon to the fascia of the expiratory muscle above it. When the four bellies of this muscle, or muscles contract, the lungs are acted upon directly, or by being compressed through the medium of the other viscera which are, so to speak, grasped during this powerful movement. At the same time, the passive inspiratory muscles are drawn up with the retreating lungs, owing to the pressure of the external air, and to the close union between the two sets of antagonistic muscles. Although the pericardium is also fastened to the expiratory tendon, this sac is so firmly bound to the plastron below it, that it does not appear to be disturbed during expiration, unless the connecting fibres are divided, in which case the heart sac and its contents are strongly drawn from the plastron, as the air is expired from the lung.

"As in the case of the inspiratory muscle, the expiratory muscle was also tested by observing its action when exposed in the living animal, and by galvanizing its fibres. The purpose of this singular sheet of muscle and connecting tendon admits then of no doubt. Aided by the elasticity of the lung, it empties that viscus of air, and no other muscle appears to lend it any aid.

"The third period of respiratory movement is marked by the closure of the glottis, and by the relaxation of the muscle of inspiration, the limbs then settling passively to their new positions. Hence the general appearance of a slight expiration at the end of the inspiratory act.

"It is impossible to review this account of the respiration in chelonians, without being struck with the simplicity of the plan. A box containing all the viscera of the chest and belly has an open space on each side, filled by a muscle of peculiar form, whose contraction increases the size of the visceral cavity, and thus causes air to rush into it. Within the breast-box, the lungs and visceral mass embraced by a single muscle, obey its contraction in effecting expiration, and as the visceral cavity thus becomes smaller, the inspiratory flank muscles curve in to fill the gap.

"After the most careful investigation, we can discover no other respiratory muscles within the breast-box.

"The muscular apparatus of the glottis is equally simple. There is a muscle to open it, and another muscle to close it. Here, as in the rest of this portion of our essay, we shall not commit ourselves by names, which, although they may recognize homologies, confuse the reader, who has sometimes to bear in mind that their functions may be exactly the reverse of those of the human muscle whose name they carry.

"The two glottic muscles have already been fully described; when both are cut away or paralyzed, by section of their nerves, the glottis still closes, owing to the elasticity of its cartilages, but it does not shut firmly, and if the lungs be previously filled with air, a large part always escapes. Under ordinary circumstances, the glottic lips are closely pressed together by the sphincter-like muscle which we have described and figured. The mass of its fibres lie below the opening muscle, and are parallel to the direction of the glottic lip, while its connections are principally at the anterior and posterior end of the glottic line. When contracted, as it always is more or less strongly during the interval between two respirations, it would tend to pucker the glottis somewhat, if it were not that the anterior and posterior insertion are firmly fixed, by the parts in front of and behind them respectively. Thus attached, the only influence it can exert, is to close the glottis whose lips stiffened by the arytenoid cartilages facilitate the process.

"The opening muscle lies outside of the closing muscle, nearly at right angles to it, and immediately under the mucous membrane of the glottic mound. At

the moment when expiration begins the respiratory act, this opening muscle contracts so as to draw the glottic lips wide open and permit the air to escape. Then follows a full inspiration, the glottis still open, and lastly it is closed by the constrictor muscle just after the great flank muscles of inspiration cease to act.

"The downward movement of the hyoid arches is effected by the omo-hyoid and other muscles of the neck. It appears to be intended to remove the glottis from contact with the roof of the mouth during the act of respiration. The upward motion of the hyoid apparatus is produced by a thin sheet of muscular fibres spread transversely across it and over the whole upper part of the neck.

"The function of all of the above muscles was determined by simple observation, by stimulating them directly, and by irritating their nerves."

With regard to the nerves employed in respiration the conclusions experimentally ascertained are, that the superior laryngeal nerves in turtles are the nerves of sensibility for the mucous membrane of the larynx and glottis; that they are the motor nerves of all the true glottic muscles, and enjoy thus the ability to open and to close this orifice; that the inferior laryngeal nerves are the motor nerves of the dilating muscles only, and have not sensibility or power to close the glottis; and that there exists a communication between the right and left superior laryngeal nerves, of the nature of a true chiasm, precisely like that of the optic nerves.

In concluding their paper, our authors bespeak attention for the following principal points as interesting novelties:—

"1st. In Chelonians the superior laryngeal nerve is distributed both to the opening and closing muscles of the glottis.

"2d. The inferior laryngeal nerve is distributed solely to the opening muscle of the glottis.

"3d. A true chiasm exists between the two superior laryngeal nerves.

"4th. The expiratory muscle lies within the breast-box, and consists of anterior and posterior bellies connected by a strong tendon continuous across the middle line, and common to both sides of the animal.

"5th. The inspiratory muscles occupy the flank spaces on either side.

"6th. Inspiration is effected by the contraction of the flank muscles, which in appearance strongly resemble the diaphragms of superior animals.

"7th. Expiration is effected by the consentaneous action of the four muscular bellies above described, which thus compress the viscera against the lungs. The act of respiration consists of an expiration and an inspiration, during which the glottis remains open.

"8th. The opening of the glottis is effected through the agency of the superior and inferior laryngeal nerves, both of which are distributed to the dilating muscle of the glottis. The superior laryngeal nerve presides over the closure of the glottis, being in part distributed to its sphincter muscle. The elastic contractility of the glottic cartilages aids in closing this orifice. After section of the superior laryngeal nerves, the glottis may still be opened by the agency of the inferior laryngeal nerves, its imperfect closure being then effected by means of the elasticity of its cartilaginous lips. The chiasm of the superior laryngeal nerves enables one of these nerves to open and shut the glottis after section or disease of the opposite nerve and of both inferior laryngeals.

"Physiologists have therefore been in error when describing the respiration of Chelonians as analogous to that of Batrachians, since it far more closely resembles the breathing of the higher vertebrates."

We cannot conclude this brief notice without expressing the earnest hope that investigations so interesting, and so auspiciously begun, will not be discontinued, but, on the contrary, prosecuted with vigour, until other and still more important results are obtained. J. A. M.

Art. XXIV.—*Diet for the Sick and Convalescent.* By E. Neal, M. D., A. L. S., University of Pennsylvania. *Indocti discant, et ament meminesse docti.* 12mo. pp. 60. Philadelphia, 1861. James Challen & Son.

The subject of diet in health and disease is one of the greatest importance. To choose properly the kind of food which is best adapted to sustain at its highest attainable grade the health and vigour and the capacity for endurance of the human organism in individuals of different ages, physical conditions, and pursuits in life, and to have it prepared for use in such a manner as shall, without impairing its nutritious properties, increase its palatableness and digestibility, requires the possession of a much larger amount of varied knowledge than would at first sight be supposed. To make a proper choice of a diet for people in health an acquaintance with the vital condition and physical strength, the nature of the occupation, and the average age of those for whom the diet is intended, with the average temperature of the climate they inhabit, the amount of active bodily labour they are called upon to perform, daily or at intervals, is essential. In addition to this there must be also an accurate knowledge of the nutritive properties of each of the several alimentary articles in common use, as well as the chemical changes which are induced in them respectively by the different modes of cookery and by the addition of certain spices. And still further, it is essential that the physiology of digestion, assimilation, and nutrition, and the building up and metamorphosis of tissue, should be well understood, in order to know how far any given class of alimentary substances are adapted to sustain the body, with all its component organs, in the required state of health and vigour. We need not be surprised, therefore, that in relation to almost every point connected with the subject gross errors are committed daily, even by those whose duty would seem to require of them an intimate acquaintance with it.

While the amount of knowledge to which we have referred is essential in order that the choice of an appropriate diet may be made for such as are in health, even still more is necessary when we come to choose a diet for the sick and convalescent. There must then be taken into consideration the condition of the digestive organs, during and immediately after an attack of disease, together with the object to be attained by giving or withholding any particular article or form of food under the circumstances of each case. This department of dietetics requires to be carefully studied anew under the increased lights which recent observations and a more careful series of investigations have cast upon it. Numerous popular errors are entertained in respect to the lightness and cooling properties, the digestibility and nutritive properties of certain kinds and preparations of alimentary matters, and their adaptedness, consequently, to patients labouring under, as well as to those recovering from, different forms of disease. These errors have been to some extent countenanced even by medical men, who, not unfrequently, have in consequence caused serious evil to be inflicted by their prescription to the sick and convalescent of an inappropriate diet.

The foregoing remarks have been suggested rather by the title than by the contents of the work before us. It is one of but little pretension. No attempt is made by the author to discuss the subject of diet generally, whether in its character of a sustainer of the health of the system during a state of entire health, of an assistant in the prevention and cure of disease, or as one of the means, and among the most important, for restoring the body to its normal condition of health and strength, after it has been prostrated by sickness. The leading, we might even say the only, object Dr. Neal appears to have had in view is to furnish a series of dietetic preparations for the sick and convalescent, arranged, with a view to their proper choice, under five heads—beginning with the least irritating, and gradually rising to the more nutritive and stimulant.

So far as the want of this limited kind of information in respect to the diet of the sick chamber shall be felt, the work of Dr. Neal will be found a useful and reliable manual. D. F. C.

# QUARTERLY SUMMARY

OF THE

# IMPROVEMENTS AND DISCOVERIES

IN THE

# MEDICAL SCIENCES.

## ANATOMY AND PHYSIOLOGY.

1. *New Motor System of the Heart.*—Professor von BEZOLD, of Jena, states that he has, in the course of some researches on the motion of the heart, discovered a new source of motor nerves of this organ, which connect it much more intimately and importantly than the cervical sympathetic or even the par vagum with the cerebro-spinal system. The following results were arrived at by him from experiments on animals paralyzed by woorara. 1. When the pneumogastric and sympathetic nerves were divided in the neck, so as to cut off the hitherto recognized conduction of nervous influence from the central organs to the heart, irritation of the medulla oblongata produced a very marked increase in frequency of the pulse and an uncommon augmentation of the pressure of the blood in the arteries—the latter being sometimes more than doubled. 2. When, further, the spinal cord was divided in these animals at any point above the seventh cervical vertebra, the activity of the heart was almost immediately diminished: the pressure of the blood in the carotid was diminished to three-fourths, the beat of the heart became weak and its sounds almost inaudible, etc. On the other hand when the division was made in the neighbourhood of the third or fourth dorsal vertebra, no such effect was produced. Hence the centre of innervation does not extend below the fourth dorsal vertebra. 3. If, after dividing the cord above the seventh cervical vertebra, the medulla oblongata or the portion of the cord above the division be irritated, however violently whether mechanically or by electricity, no change is produced in the pressure of the blood or in the frequency of the pulse. But if the portion of the cord on the distal side of the division be irritated, the blood-pressure and the heart's action, which have been diminished by the section, may be raised to or even above the normal height. Hence the motor nerves (exclusive of the par vagum and cervical sympathetic) do not come off above the seventh cervical vertebra. 4. If, in partially poisoned animals, the medulla oblongata and the peripheric portion of the divided vagi be simultaneously irritated, the results are, not an increase, but a diminution, of the pressure of the blood; not an acceleration of the pulse, but a retardation or even cessation. Bezold derives the following conclusions from his experiments. *a.* He believes he has ascertained the existence of a new central organ for the motions of the heart, having its seat neither in the medulla oblongata nor in the brain. *b.* Its fibres run through the cervical spinal cord, and pass out between the seventh cervical and fifth dorsal vertebræ. *c.* They very probably pass through the lower cervical and upper dorsal sympathetic ganglia, and enter the breast as the lower and middle cardiac nerves. *d.* This central motor organ normally furnishes three-fourths of the entire propulsive force of the heart; when it is abnormally irritated, the energy of the contractions of the heart may be increased sixfold. *e.* This cardiac

nervous system, apparently having its seat in the medulla oblongata, stands in a reflex connection with the sensory cerebro-spinal fibres. *f.* Various poisons, especially digitalis and strychnia, increase and strengthen the heart's beat, after division of the vagus, by increasing the irritability and activity of this cerebro-spinal cardiac nervous system.—*British Med. Journ.* of Feb. 1863, from *Berlin Med. Centralzeitung*, and *Wiener Med. Wochenschrift*, Dec. 20, 1862.

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2. *Physiological Anatomy of the Lungs.*—Dr. NEWTON HEALE read before the Royal Medical and Chirurgical Society a paper on this subject.

The following points in connection with the physiological anatomy of the lungs have been elicited as the result of investigations made by the author:—

First. As regards the pleura.

Certain longitudinal channels are to be found in it. These are pervious to air, and are connected with the minutest air-passages in the substance of the lungs by means of tubular passages in the subpleural cellular tissue. They are surrounded by a vascular plexus, derived from the pulmonary system of blood-vessels.

Second. As relates to the manner in which the air is distributed throughout the lungs.

A remarkable difference is to be noticed in what is ordinarily called the bifurcation of the trachea as it exists in the human subject contrasted with that of other mammalia. In the latter a large trunk is given off from the windpipe before it reaches the spot which is usually called its bifurcation. This trunk goes to the upper part of the right lung. The left bronchus is therefore, in those animals, the second alternate branch which proceeds from the main air-pipe. Each bronchial tube, instead of splitting up equally into lesser tubes, and thereby forming a dichotomous or a trichotomous division, passes towards the margins of the lobes in a continuous direction, though diminishing in size. It gives off its branches in an alternate manner, and each of the subordinate tubes pursues a similar course. When they have arrived at a certain degree of diminution, a set of membranous tubes, differing in some respects from the bronchial tubes, and also from the air-cells, but being intermediate in character between the two, are sent off from the terminal bronchial tubes. To these membranous tubes the author attaches the name of pedicles. The true pulmonary tissue is quite distinct in its anatomical peculiarities from those of the bronchial tubes, however small these may be. It does not at all resemble them, and they cannot be mistaken the one for the other. The ultimate parenchyma of the lungs is made up of little bodies, to which the author attaches the name of "leaflets." The pedicles connect the terminal bronchial tubes with the leaflets; and many pedicles from different terminal tubes enter into each leaflet. This peculiarity in the leaflets causes a very minute anastomosis to take place between the different bronchial tubes, which could not occur if the ordinary description were correct.

Third. The author does not profess to have contributed any fresh facts relating to the lymphatics or to the nerves as to their purely anatomical characters.

Fourth. With reference to the characters and functions of the so-called bronchial arteries.

The author prefers to give the name of sustinent arteries and veins to the bloodvessels usually denominated bronchial. He considers that the latter word implies that they have some peculiar relation to the bronchial tubes, and more especially to the bronchial membrane, which is a destination usually attributed to them. They have in consequence been supposed to be the vessels peculiarly engaged in the pathological condition known as bronchitis. The author's investigations show that every sort of vascular action throughout every part of the lungs, by which any damage to its tissue is remedied, is accomplished through the sustinent vessels exclusively, although the peculiar plexus by which the whole of the mucous surface is covered, and by which the bronchial mucus is supplied, is not in any degree contributed by the so-called bronchial arteries. Physiologically and anatomically, the sustinent and pulmonary systems are quite distinct. While the duty of repairing the tissue of every part of the lungs devolves upon the sustinent vessels, that of bringing the venous blood

furnished by the right side of the heart into contact with the air, and of accomplishing the physiological purposes which are aimed at by that arrangement, is intrusted solely to the pulmonary vessels. The purpose for which the vascular plexus is spread out in the mucous membrane is entirely connected with the atmospheric influences, and the large surface which that membrane affords for the furtherance of that object is thus turned to account, and the plexus itself is consequently in exclusive relation with the pulmonary system of bloodvessels. Modern authors, with the exception of Dr. Harrison, of Dublin, concur in believing that there is some kind of anastomosis between the minute branches of the pulmonary and sustinent vessels. That gentleman with great truthfulness and candour, acknowledges that he has not been able to satisfy himself that the presumed anastomosis has not been the result of the rupture of one or both sets of vessels in the act of injecting them.

The author of this paper has found that the vasa vasorum of the pulmonary vessels are supplied entirely by the sustinent arteries; and that when the latter have been fully distended, and some degree of violence has afterwards been used, the minute capillaries in connection with the sustinent arteries which are spread over the interior of the walls of the larger pulmonary vessels have sometimes been made to burst, and a false communication into the canal of one of the pulmonary vessels has thus been made. A channel for the injection having been once established by an accident of this nature, it becomes gradually enlarged in proportion as the injection is afterwards made to flow through the rent, and an unlimited quantity of injection may then be made to flow through the artificial passage. The pulmonary and sustinent vessels cannot be made to communicate with one another by any other means than this.

It has been a disputed point as to whether the so-called bronchial arteries are furnished with veins. It is, however, easily shown that sustinent veins accompany the bronchial tubes, returning the residual blood supplied by the sustinent arteries to the internal parts of the lungs; and that other sustinent veins ramify in the subpleural tissue, which collect the blood from the exterior of those organs.

Attention is called to the fact that the sustinent veins are furnished with valves, and with cross branches of anastomosis. These last facts are of some importance, not with regard to the lungs only, but also with reference to the bloodvessels, which discharge in other viscera a function similar to that of the sustinent arteries.

Fifth. As relates to the distribution of the pulmonary vessels.

Modern authors describe the *pulmonary arteries* as accompanying the bronchial tubes; as continuing to divide again and again, becoming more numerous than the tubes; as giving off branches of supply to the various tissues; as anastomosing with the so-called bronchial arteries; and their residue as being ultimately distributed to the air-cells. The author considers this account to be far from accurate. He finds that the pulmonary arteries never give off branches of supply to *any* tissue. They never form any anastomosis either among themselves or with any other bloodvessel. They do not become more numerous than the bronchial tubes, since each of these is accompanied by one, and never more than one, pulmonary artery, which pursues in relation to it a perfectly definite and invariable course; and the final distribution of every portion of the pulmonary artery, down to the minutest fragment, is precisely and entirely alike. The whole of it is split up so as to form the remarkable anastomosing plexus in the leaflets. The pulmonary *veins* commence in the interior of the leaflets by *tufts* of capillaries. The veins formed from these commencements are placed, in the first instance, at some distance from the bronchial tubes; but as they increase in size they come into contact with them. A remarkably vascular plexus, composed exclusively of pulmonary vessels, occupies the whole surface of the mucous membrane. This is derived as an offshoot from the plexus in the leaflets, and is reinforced in the larger tubes by bloodvessels furnished from the leaflets which cling to the tubes externally, and send perforating branches to the plexus in the membrane. Some *ramusculi* are also placed externally to the tubes. They collect the blood from the plexus in the membrane, and convey it to the larger pulmonary veins, the formation of which has

been described above. There are, therefore, in the first instance, two distinct sets of minute pulmonary veins. One of these, after leaving the leaflets, makes its way at once in a direction towards the left auricle, without undergoing any further exposure to the air. The other is spread over the mucous membrane, and derives the benefit of the atmospheric influence which the surface of that membrane affords, and ultimately joins the other portion. The anatomical distribution of the pulmonary vessels indisputably proves that their physiological function is exclusively in relation with the air supplied by the bronchial tubes, and that it is totally independent of any purpose having relation to the construction or repair of any part of the *tissue* of the lungs.

(The paper was accompanied by numerous drawings and diagrams.)

Dr. Heale, at the request of the President, drew attention to the apparatus which he employed. He showed that in injecting the pulmonary arteries and veins with different colours both should be injected simultaneously, so that the two fluids should meet in the capillaries. If the arteries by themselves were injected first, the fluid passing through the capillaries into the larger vessels beyond would prevent the proper injection afterwards of the veins, and *vice versâ*. He showed that no anastomosis existed between the so-called bronchial vessels and those of the pulmonary system, as the capillaries of the first could be injected in every part of the lungs without any of the injection reaching any of the other vessels. In speaking of the distribution of the air to the tissue of the lungs, he mentioned that a very free anastomosis was established between the air contained in different parts of the lungs after the bronchial tubes had reached their minutest subdivision. Dr. Heale gives the name of pedicles to the smallest of the bronchial tubes, and that of leaflets to the ultimate subdivisions of the pulmonary tissue. He showed that there was a complex inosculation between different leaflets and pedicles. The equal diffusion of air throughout the lungs is further provided for by tubular passages which ramify in the subpleural and interlobular cellular tissue, and communicate with longitudinal channels in the substance of the pleura. Passing to the physiological points involved in the various anatomical details, he remarked that it was usual to speak of respiration as one thing, of circulation as another, and of nutrition as a third; but that in point of fact all three were parts of one and the same physiological operation, and that it was as impossible that the circulation or the nutrition should go on independently of the respiratory processes as that the hands of a watch should continue to point the hour when the mainspring was impeded in its action. Dr. Heale then explained at some length his views with regard to the heart's action in effecting the circulation of the blood, the physiology of respiration, &c.

In answer to a question from Dr. Lee, Mr. Heale stated that he had been engaged during the last two years in dissecting the ganglia and nerves of the lungs, and that in these dissections a great system of ganglia and nerves was displayed throughout the lungs; and he considered that without taking into account these nervous structures of the lungs the functions of those organs could not be explained.—*Med. Times and Gaz.*, May 30, 1863.

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3. *Fœtus born without Heart, Brain, Lungs, or Liver.*—Dr. Wm. H. Dickinson read before the Royal Medical and Chirurgical Society (May 12th, 1863) a description of a monster of this kind.

This being, like all others of the same character, was a twin. Both umbilical cords were attached to a single elongated placenta. The imperfect fœtus was devoid of any vestige of head or neck. The upper extremities were present, but were in some respects imperfect. On the anterior surface was a small prominence, which appeared to represent the tip of the tongue. The umbilical cord was surrounded at its fœtal extremity by a small membranous bag, which contained a coil of intestine. The lower extremities were only slightly different from their usual state. The body was generally swollen and œdematous. The spinal column was deficient from the second cervical vertebra upwards. No trace of any cranial bones could be discovered. The clavicles were absent. The integuments were of unusual thickness, owing to a general infiltration of serous fluid. In the cavity of the trunk lay the lower two feet of the intestine,

which commenced by a cæcal extremity, and two large kidneys. The ureters, the bladder, the urachus, and a pair of undescended testicles were found in their normal relations. The other viscera were absent. The umbilical cord contained a large vein and artery. The artery divided on entering the belly into two large branches, one of which passed into the right thigh and side of the pelvis. The other division served for all the rest of the body. It swept upwards to the position due to the aorta on the left side of the spine, and gave off vessels for the left thigh, for the left side of the pelvis, and for the kidneys. It terminated between the shoulders by dividing abruptly into two large branches, which went to each upper extremity. The veins were arranged in an almost parallel manner. There was no communication between the two sets of vessels corresponding to the foramen ovale. The entire encephalon and the upper part of the spinal cord were wanting. The sympathetic ganglia were large, but not numerous. A chain of eight lay along the side of the vertebral column. Numerous filaments maintained the connection between the sympathetic ganglia and the spinal nerves.

Since there was no communication between the veins and arteries of the fœtus answering to the foramen ovale, but the veins throughout the body were simply continuous with the umbilical vein, and the arteries with the umbilical artery, it was inferred that either in the cord or in the body of the monstrosity the usual direction of the blood must have been inverted. If it passed, as usual, from the mother down the umbilical vein, then it must have been continued into the tissues by the veins of the fœtus. On the other hand, if the course of the circulation was not thus reversed in the fœtus, the artery of the cord must have brought the supply from the placenta.

This question was discussed, and the author finally adopted a suggestion of the late Dr. Young, which had been worked out by Sir Astley Cooper, that the circulation in such monstrosities is due to the impulse of the heart of the healthy fœtus, which always accompanies them, and which is conveyed through anastomosing vessels between the two cords upon the surface of the common placenta. The blood thus reaches the imperfect fœtus through its umbilical artery, and is thence distributed to its tissues.

Mr. Savory said, cases like the one just related were especially interesting with regard to the forces concerned in the circulation of the blood. He believed it was now generally accepted that the heart was not the sole agent in the movement of the blood. Of the other forces employed, that which was generated at the capillaries was assuredly not the least. But cases like the present one confirmed this doctrine; for in this, as in some others, especially the case recorded by Houston, it seemed almost impossible, after a careful study of their anatomy, to arrive at the conclusion that the heart of the healthy child was sufficient to maintain, not only its own circulation, but that of the monster also. These cases, he thought, might be profitably studied by the light of comparative physiology. Just as in the lower vertebrata—as in fishes—where the small and single ventricle seemed manifestly insufficient to accomplish unaided the circulation through the capillaries of gills and system; just as in some of the lowest of the invertebrata, where, as in plants, the movement is maintained without a heart of any kind: so in these monstrous forms among the highest we must more clearly recognize, in the absence of a heart, the existence of independent forces to circulate the blood.

Dr. Heale called attention to the fact that there must be some force acting on the circulation in the capillaries distinct from that of the heart's pulsation, in order to remedy after each pulsation the distension of the bloodvessels, which would otherwise remain in a state of maximum distension, and be unable to yield any longer to the ensuing pulsation. This force, which empties the capillaries, must be quite as real and important as that which distended them. The changes which occurred during these intervals were precisely those for which the pulsation was calculated to furnish the materials, and they embraced all the strictly vital operations which occurred both in the pulmonary capillaries and in the system at large, and the two balanced each other with the greatest exactness. For, supposing it possible (which it is not) that one or the other should preponderate, the blood would immediately become either too arterial or too

venous, as the case might be—a state of things which would necessarily be corrected in the very next pulsation. The heart's action therefore became auxiliary to the action of the capillaries. The placenta of the fœtus accomplished for it precisely what the lungs did for the adult. The difficulty of explaining how the circulation might have been carried on in the acardiac fœtus was materially lessened by these considerations.

Dr. Dickinson, in reply to the remarks of Mr. Savory, allowed the possible existence of a force which promoted the circulation of the blood independently of the action of the heart. In vegetables the circulation was carried on by this alone; but the higher in the animal scale, the more active the circulation and the more necessary the heart. It could not be supposed that in the human fœtus the circulation could be maintained without this organ. It was almost proved that the circulation depended on the heart of the other twin by the fact that in every case of acardiac monstrosity not only was the monster a twin, but it was attached to the same placenta as served for the other child. If the circulation depended on forces within its own body, there could be no reason why it should not be carried on without this connection.—*Lancet*, May 23, 1863.

## MATERIA MEDICA AND PHARMACY.

4. *Effect of Tobacco Smoking upon Pulsation.*—DR. EDW. SMITH relates (*Lancet*, March 14, 1863) some experiments to determine the effect of tobacco smoking upon the rapidity of the pulse. These experiments are limited, but Dr. S. thinks that they suffice "to show that tobacco acts variously upon different persons, and that there are those in whom it increases the action of the heart in an important degree. This difference must be sought for in the mode of smoking, the quantity of tobacco consumed in a given time, the reputed strength of the tobacco, and the habits and temperament of the smoker; and upon these questions I would offer an observation or two, with a view to further inquiry.

"1. *The mode of smoking.*—I do not smoke, but I have very carefully tested the mode of smoking, and agree with those who affirm that in ordinary circumstances the tobacco smoke is not mixed with the air in inspiration and carried into the lungs. The position of the throat is that which occurs in ordinary breathing through the nose—viz., the soft palate falls down, and the tongue is raised, so as to cut off the communication between the mouth and the throat. The two acts do not necessarily take place simultaneously. Whenever, as by an accident, a little tobacco smoke is inhaled, the smoker is at once conscious of irritation or choking in the throat, probably followed by cough. If any one have doubt upon this matter, let him endeavour to smoke with the nostrils closed and he will find the act impossible; but it may yet be possible that in cases in which affections of the throat are found in smokers the act may be performed carelessly, or from some cause the tobacco-smoke may frequently touch the pharynx. If the tobacco-smoke be not thus taken into the system, in what manner are the effects upon the pulse induced? It must be chiefly through solution in the saliva, which is then partly absorbed by the absorbent vessels, and partly swallowed, and thus introduced into the system. Whether frequent spitting would prevent or lessen the action needs to be further tested, but within limits it is probable that it would lesson it.

"2. *The quantity of tobacco consumed in a given time.*—In pursuing the inquiry it will be important to aim at uniformity in this respect, and direct that the act be nearly constantly performed so that the smoke may not escape from the open bowl, and that an ordinary bowlful be consumed in 20 minutes. Although it did not appear from Mr. D——'s experiments that rapidity of smoking varied the result, we must remember that the effect of the tobacco upon the pulse had then already been attained, and he is conscious that rapid smoking would make him ill, whilst smoking at the ordinary rate would be agreeable.

"3. *The strength of the tobacco.*—Smokers speak of strength of tobacco in two senses. Those accustomed to the fancy kinds of tobacco assert that the common shag or Virginian tobacco would make them ill, and also that certain tobaccos taste hot in the mouth. These two statements may probably refer to the two principal constituents of the tobacco—viz., the narcotine, which is so powerful a poison, and the empyreumatic oil, which would cause irritation of the mucous membrane of the mouth; and it is certain that, whilst the wholesale dealers in tobacco find many of the present fancy tobaccos in the same hogshead produced from the same soil, there are also diversities in the constituents of the tobacco, grown under different climates, upon different soils, and prepared for the market in different manners. I believe that with smokers in general the idea of strength is much more the effect upon the mouth than upon the general system. In the experiments referred to, the strong Bristol bird's eye had no more effect upon the pulse than the so called milder forms. It is probable that smoking is very much a gratification rather of the palate than of the sensorium.

"4. *Habits and temperament.*—Both Mr. D—— and Dr. H—— were well inured smokers; but, as we have seen, the effect upon them was well marked. Dr. H—— is beyond comparison more sensitive in temperament than Mr. D——, and yet the effect of tobacco upon him was much less. Hence, in reference to this action upon the pulse, neither of these conditions can be accepted as grounds for variation in the effect.

"I have referred in this paper to the action upon the pulse only, and not to the supposed sedative action upon the system generally, both because such an action is quite new to us, and because it is the only one of the two which can be well defined; but I do not for a moment wish to be understood to mean that this general action does not exist. It is, however, now impossible to look upon a dreamy state, a semi-narcotism, as the essential one of tobacco smoking; for when the pulse is excited in the manner now shown, the action is one of stimulation as perfect to appearance as if induced by food, and as fitted temporarily, and under proper conditions of food, to excite the activity of the brain or other organs. If the experience of literary men has shown that in some the necessary activity of brain is obtained only after the exhibition of strong wines and spirits, it may now be proved that in certain persons tobacco-smoking produces a similar result, and by quickening the pulse, and in a certain degree filling it also, it may excite all vital actions. In such a state of atonicity of system, when tobacco produces the effect upon the heart already described, it is easy to believe it a remediable agent of great value. But if there be not a state of atonicity, but on the other hand a tendency to fulness of system, what so certain as that this important action upon the heart must lead to disturbed sleep and conditions tending to apoplexy?"

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5. *On Cinchonine as a Substitute for Quinine.*—Dr. W. F. Daniell, of Kingston, Jamaica, writes to Professor Bentley as follows:—

"In the *Pharmaceutical Journal* for February last, I observe an interesting paper by Mr. Joseph Ince, recommending the salts of cinchonine in lieu of those of quinine; now so far as my experience extends with reference to the employment of cinchonine in the treatment of febrile and other miasmatic diseases of Western Africa, it has proved a decided failure, owing to the headache which has uniformly attended its administration. When I was in medical charge of the troops in Sierra Leone, a large quantity of cinchonine was furnished to the hospital with the view of testing its remedial properties, and also of ascertaining whether it would not answer as an economical substitute for quinine. It was therefore given to both European and negro patients who were suffering under the milder forms of remittent and intermittent fevers, and free from any local congestions, in the ordinary doses in which the sulphate of quinine was used. The results of the trial were, however, of such an unsatisfactory character, from the pain and cerebral congestion induced, that the medicine had to be discontinued. It was subsequently combined with calomel and morphia, but without any sensible diminution of the cerebral disturbance. When conjoined with the latter, delirium sometimes sets in, which was only

relieved by the application of blisters to the neck. With these drawbacks, therefore, cinchonine can never be resorted to as an efficient substitute for quinine in the treatment of tropical diseases."

6. *Assimilation of Lactate of Iron, and its Superiority over the other Chalybeates in reference to Digestion.* By A. CORDIER, M. D.—In order to appreciate the different preparations of iron, their action on the gastric juice has of late been the subject of frequent consideration, and rightly so, as it was to be determined whether the gastric juice, by dissolving the chalybeates or combining with them, would not be found wanting in its proper place and time, the act of digestion. Meanwhile, we have, like the majority of the profession, continued to prescribe the lactate of iron, as the safest preparation in point of digestion.

Indeed, since 1839, when MM. Gelis and Conté presented their first paper to the Imperial Academy of Medicine, the lactate of iron has continually risen in the favour of the profession, and as clinical observation has more than sufficiently proved its eminent value, we feel much satisfaction in supporting this opinion by some new physiological facts and experiments.

That the lactate of iron is the only chalybeate which can be prepared in the human body is easily proved, by digesting for twelve hours at a temperature of 104° some iron filings with distilled water and calf's rennet. Hydrogen is disengaged and lactate of iron formed, because lactic acid is contained in the gastric juice, and in fact is that acid, which imparts to the same its acidity. This has been proved to evidence by MM. Claude Bernard, Barreswill, Chevreul, Leuret, Lassaigne, and others.

*Besides, M. Bernard has shown that the lactate of iron can be injected into the veins in large quantity without producing any accidents*—an experiment speaking highly in favour of MM. Gelis and Conté's preparation. (*Archives de Médecine*, vol. xvi. page 87.)

The lactate of iron combines itself readily with the albuminous fluids, and loses the property of being precipitated. (Mitscherlich, Bernard.) Those combinations are readily assimilated without fatiguing the stomach. Unlike other chalybeates, the lactate of iron, far from impeding digestion and weakening the appetite, rather strengthens them, as it has also been stated by M. Bouillaud in his report on the lactate of iron to the Imperial Academy of Medicine. MM. Fouquier and Hardy, in a note annexed to this report, say: "We have several times prescribed the pastils of lactate of iron in cases of chlorosis with amenorrhœa, and after three or four days there was always such an increase of appetite that the patients complained of the insufficiency of their diet," &c. &c. Experience has now sufficiently proved not only the excellence of MM. Gelis and Conté's pastils in all cases where ferruginous preparations are required, but also their superiority over other preparations, where a weak or diseased stomach has to be taken into consideration. The reason of this is partly intelligible from the above remarks; but there are other proofs which we will presently consider.

In experimenting on the digestibility of medicines, M. Quevenne has found that a dose of thirty grains of reduced iron, or of the sesquioxide, even when taken at meals, produces diarrhœa and vomiting, while the lactate administered eight times, at a dose of fifteen to thirty grains, produces no inconvenience; thirty grains only appeared to affect the animals experimented upon. This difference appears to be due to the stomach having in the first case to dissolve and transform into lactates the above-named preparations of iron, while in the latter case it receives the lactate already formed. If the stomach of healthy animals is differently affected, how much more will this be in the case of a reconvalescent or a chlorotic patient?

Recent experiments have given new support to the view which we hold of the preference to be given to the lactate over other less soluble preparations. M. Felix Boudet undertook a series of experiments to ascertain whether the salts of iron which are precipitated on contact with the gastric juice require for their absorption any considerable quantity of this valuable and important liquid. (Report on the Therapeutic Use of Pyrophosphate of Iron, read before the Imperial Academy of Medicine, July 13, 1858, &c. &c.) He says: "My experiments were made with the assistance of MM. Roubiquet, Corvisart, and

Boudault, who themselves are occupied with a general work on the relation and reaction between the gastric juice and a large number of drugs."

One drachm of fibrin and two and a half of fresh gastric juice of a dog mixed and kept for six hours at a temperature of 104°, the fibrin is dissolved and completely transformed into albuminose. But if one introduces at the same time any substance antagonistic to the action of the gastric juice, the fibrin is not or only partially digested.

In order of ascertaining the degree of digestion, MM. Boudault and Corvisart apply three consecutive tests: 1st. Boiling. 2d. Barreswill's liquor. 3d. Glucose added to Barreswill's liquor. If digestion has been completed, the obtained produce does not coagulate at 212°, turns into deep violet when boiled with Barreswill's liquor, and prevents this liquor to be reduced by glucose.

But if digestion has not taken place, the obtained produce is not turned into violet by Barreswill's liquor, and glucose readily reduces the liquor.

In case of incomplete digestion, the above tests are less marked one way or the other. These tests have been applied by me to different compounds of iron, of which in each case I employed so much as to represent three-fourths of a grain of metallic iron. The result has been—*with lactate of iron*, DIGESTION COMPLETE; consequently no modification of the action of the gastric juice by its presence. *With tartrate of iron and potash, citrate of iron, pyrophosphate of ammonia*, DIGESTION NULL; *with three-twentieth grain of reduced iron*, COMPLETE; with six-twentieth, INCOMPLETE DIGESTION.

Experiments with the pyrophosphates of iron and soda appear to have an equally paralyzing effect on the gastric juice. The same results had been obtained by MM. Boudault and Corvisart in previous experiments.

So besides clinical observation, chemistry and physiology have testified to the superiority of the lactate of iron, which has since a long time, and mainly through the pastils of MM. Gelis and Conté, proved itself to be the most digestible of all ferruginous preparations.—*Dublin Med. Press*, March 4, 1863.

7. *Picronitrate of Potash as a Vermifuge.*—Some months ago Dr. FRIEDRICH, of Heidelberg, described, in Virchow's *Archiv*, the beneficial effects of picronitrate of potash in cases of trichina. The remedy has also been employed in tænia. Dr. WALTER, of Offenbach, relates the case of a woman aged 30, who had *tænia solium* for several years. During fifteen months he had employed all known remedies for tapeworm, including the bark of the root of the pomegranate, considered by some as infallible. On November 15, 1862, he gave the patient five pills, each containing five *centigrammes* of picronitrate of potash. On the 20th, an entire worm was expelled with the head. Four days after taking the medicine, the patient presented a jaundiced appearance.—*Dublin Med. Press*. May 27, 1863, from *Archiv. fur Pathol. Anat. und Phys.*

8. *Permanganate of Potash as a Disinfectant.*—Dr. PLOSS speaks in the highest terms of the disinfecting power of this substance. It effectually removes all smell from the most stinking suppurating sores and discharges. Most remarkable results of this kind have followed its injection, repeated several times a day, in cases of cancer of the uterus—half a drachm to 8 ounces of distilled water being a good proportion. In the case of open wounds and ulcers, all the dressing covering them should be moistened with the solution. No means succeeds more rapidly than this in removing the disagreeable smell of the hands after the performance of autopsies, for which purpose a stronger solution (ʒss ad ℥j) may be employed. It is far superior to chlorine in its effects, which are not, as is the case with that substance, fugitive. For this reason it is a superior prophylactic, applied to the hands of accoucheurs, to chlorine in puerperal fever. In ozæna it is strongly to be recommended, the solution (℈ss ad ℥viiij) being introduced into the nares by means of a caoutchouc syphon. In bad smells of the mouth, resulting from carious teeth, it is an admirable means, a little cotton wool being moistened in a weak solution. Finally, the permanganate is to be recommended as a wash for stinking feet. This remedy deeply stains linen it comes in contact with, but the spots may be removed by means of the sulphate of iron.—*Medical Times and Gazette*, May 30th, 1863, from *Varges' Zeitschrift*, N. S., vol i.

9. *Uses and Value of Galvanism and Electricity in General Practice.*—Mr. HARVEY LOBB read a paper on this subject before the Harveian Society (Feb. 19, 1863). He commenced by stating that it was not to be supposed that galvanism was only useful in the hands of the specialist, but that there was a wide field open to its use in general practice; and after some remarks upon the resemblance of the nerve and galvanic currents, proceeded to describe the apparatus he recommended for general use, consisting of, first, the electro-magnetic and magneto-electric machines for producing energetic interrupted currents, for stimulating and revulsive effects; and, secondly, the Pulvermacher galvanic battery for the generation of the continuous galvanic current. These are all that is necessary for general practice, producing the ordinary results in electro-therapeutics, and can be highly recommended for their portability, cleanliness, and non-liability to get out of order. Mr. Lobb then demonstrated the action of each apparatus, describing the necessary conductors, and their application to the eye, the teeth, the uterus, the muscles, nerves, etc. He also described the method of employing the electric bath as a general stimulant, stating how valuable electricity was in diagnosing the seat of obscure diseases; that frequently the organ in fault was found to be quite remote from the suspected one. He gave the following explanation of the term "Faradization," now frequently met with in the writings of medical electricians: "The term Faradization was applied by Dr. Duchenne, of Paris, to the application of electricity derived from the secondary or finer wire of the electro-magnetic battery to the treatment of disease, out of honour to our distinguished countryman, Professor Faraday, who observed that whenever an insulated wire was brought within the influence of a wire along which a current of electricity was flowing from the positive to the negative plate of the voltaic battery, a current in the opposite direction was induced in the secondary wire of a higher degree of intensity than the current in the primary wire. Making use of this fact in conjunction with the previously-discovered one, of the increase of intensity caused by winding the insulated wires in a helix round a core of soft iron, the electro-magnetic battery was invested, and it is the application of the induced current derived from the secondary or finer wire of this battery to which the term 'Faradization' has been applied." Mr. Lobb then proceeded to the therapeutics of galvanism, first explaining the great value of electricity in all cases of chronic rheumatism, stating that he had frequently cured rheumatic paralysis of long-standing in one or two sittings. He always applied, first, a sharp current upon the skin over the affected muscles, by means of dry metallic conductors, then stimulated each paralyzed muscle to contract with the aid of moist conductors. The treatment by galvanism of the following affections were then explained in order: Neuralgia, by means of the continuous galvanic current; constipation, mixed, continuous, and Faradization; chlorosis, amenorrhœa, dysmenorrhœa, mixed; its value in midwifery practice to arrest hemorrhage, to stimulate the uterus to contract, to excite premature labour, or expel a polypus; its uses in chest affections, asthma, aphonia, in indigestion; in affections of the nervous system, paralysis, functional, reflex, and organic; anæsthesia, chorea, delirium tremens; in muscular debility, spinal curvature, knock-knees, and bow-legs; confidently prognosticating that before many years the orthopædic surgeons would set aside the use of the knife and of irons, and depend upon electricity for a cure. Its value in inveterate ulcers and carbuncle, and its probable application in malignant disease, concluding with the method of its administration in drowning, chloroform accidents, and poisoning. Mr. Lobb then described several cases lately treated by him in the London Galvanic Hospital, particularly some cases of dropped hands, the result of poisoning by lead, which he had been the means of rapidly curing, also a very interesting case of torticollis, and a very uncommon instance of complete rheumatic paraplegia, quite cured by the continuous galvanic current in three months. The author hoped that the time was not far distant when every educated practitioner would be as familiar with the application of galvanism in the treatment of disease as he now was with the administration of drugs; each aided the other, and their judicious combination was now producing results hitherto undreamt of; numerous cases formerly abandoned as incurable were now amenable to treatment, and advanc-

ing science was continually adding to their number. Mr. Lobb concluded a very interesting and suggestive paper by requesting the members to investigate the subject, and experiment upon the value of galvanism as a therapeutic agent, promising ample reward for labour.—*Med. Times and Gaz.*, May 9, 1863.

10. *Ready-made Plasters.*—Dr. Tilt drew the attention of the Obstetrical Society of London (March 4, 1863) to the fact that when one hundred or a hundred and fifty grains of common starch are boiled in an ounce of glycerine, the result is a very stiff glutinous compound, which has no smell, and does not become rancid; and although sticking firmly to the skin, it can be removed and reapplied. Instead of ordering belladonna plaster, Dr. Tilt prescribes three grains of sulphate of atropia to be rubbed down with a few drops of glycerine, then incorporated with an ounce of hard glycerine ointment, and thickly spread by the patient on gutta-percha cloth, or impermeable wash cloth. This can be removed for the morning ablutions, and reapplied after spreading a little more ointment on the same plaster. Morphia and other alkaloids are prescribed in the same way.—*Med. Times and Gaz.*, April 18th, 1863.

11. *Ointment for Bed Sores.*—The following ointment is said to be an efficacious application to bed sores. ℞.—Armenian bole, prepared litharge, of each, ℥ss; camphor, gr. v; yellow wax, ℥ij; lard, ℥vj.—M. To be spread on thick linen.

## MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

12. *Spontaneous Origin of Eruptive Fevers.*—M. Roger communicated to the Paris Hospital Society the fact that a somewhat severe epidemic of scarlatina and measles had prevailed for some time past at the Children's Hospital. In a case of scarlatina, proving fatal on the third day, two series of lesions, both remarkable for their intensity, were observed. The first of these was a considerable *psorenteritis*, in which the follicles of the small intestine presented a development such as is rarely seen in typhoid fever, but unaccompanied by ulceration. The other lesion was a most intense, violaceous congestion of all the viscera, brain, spleen, kidneys, etc.—the testicles themselves and the tunica albuginea presenting a turgescent lividity. But the highest degree of congestion was found in the lungs, which were gorged with blood, of a violet red, and of a soft consistence. The pulmonary vessels were filled with black, semi-coagulated blood. At the inferior lobe of the right lung there was a vast apoplectic extravasation. In this case the condition of the lung would prove a cause of rapid death independently of the scarlatina poison.

M. Chauffard was of opinion that, with respect to the eruptive fevers, there is too great a disposition to refer them to contagion or infection. The rapid appearance and vast extension of these epidemics would seem rather to point to a kind of spontaneous production, the causes of which are at present not understood. M. Roger was much disposed to agree in this opinion; for in private practice, in which the progress of these cases can be better followed, it is not always possible to refer them to a contagious origin; and, in the midst of epidemics, unable to follow the traces of a contagion, we are often obliged to at least admit the appearance of a spontaneous eclosion. Quite lately M. Roger has met with two cases of measles followed by pertussis; this secondary affection being only explicable by its importation during the short visit of the medical attendant, or by its spontaneous origin, for the children had been most carefully isolated. M. Behier, in corroboration, observed that towards the spring and autumn he has every year observed epidemics of eruptive fevers break out in the different schools in Paris, situated at such remote distances from each other as to exclude all idea of contagion. He took this opportunity of mentioning a remarkable case. He had attended three children of a family for the measles, and was

called five or six years later to see one of these children who had a well-marked second attack of measles. The parents were congratulating themselves at the absence of the other two, at boarding-school, when at the very time of the visit one of these latter was sent home, also suffering from measles. How rapidly contagion is sometimes communicated he illustrated by another case. A mother, entering the Tuileries with her child, on hearing an infant near her suffering under a paroxysm of pertussis, at once withdrew. Nevertheless, at the end of some days her child was seized with pertussis. M. Empis considered the admission of the spontaneous development of the eruptive fevers to be a mere gratuitous hypothesis, which may have a mischievous effect by diminishing circumspection in regard to preservative measures. The true mode of propagation of these affections is by infection, to which in populous localities there is constant exposure. M. Roger explained that no one would think of contesting the contagion of the eruptive fevers. All that is now advanced is that we may admit a kind of spontaneous development when contagion has not been in operation. M. Chauffard observed that, while it cannot be doubted that certain diseases were originally imported from distant regions, yet, once brought here, may they not become in some sort naturalized, and be liable to spontaneous development? In 1855 there had been numerous cases of cholera in Paris without any such appearing in the provinces, when, on June 7, the same day on which the first case was observed at Avignon, the disease appeared at several distant points. Here spontaneous production is a more natural explanation than infection; and do we not see the same thing occurring daily with respect to variola, rubeola, and scarlatina? M. Simonet replied that a geographical progress has always been attributed to cholera. Its propagation may thus be traced, and its spontaneous origin here cannot be admitted. As to the eruptive fevers, children are constantly taken to the promenades, and how are we to ascertain when and how they have contracted the contagion? M. Guérard remarked that we have constantly the opportunity of observing that the most infectious diseases may affect isolated individuals, without any epidemic or endemic extension. These are sporadic cases, which in some manner preserve the germ of the disease, special influences, the nature of which we are ignorant, being requisite to give to this germ the generalization of an epidemic. These great epidemic manifestations, such as the variola of 1825, are generally somewhat sudden in their origin, rapid in their progress, and, in this sense, of spontaneous origin.—*Med. Times and Gaz.*, April 25, 1863, from *l'Union Médicale*, No. 48.

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13. *Contribution to the Therapeutics of Continued Fever.*—Dr. THOMAS K. CHAMBERS presented to the Royal Medical and Chirurgical Society (April 28th, 1863), an *analysis of* 214 *cases of fever*:—

108 treated on "general principles."

106 treated on a uniform plan of continuous nutriment and hydrochloric acid.

The first series occurred during the six years ending September, 1857; the second series during the five and a half years ending March 31st, 1863.

*Reasons for the cases being fairly comparable.*—1. They are each a consecutive series. 2. They are spread over a considerable period of years. 3. All treated by the same physician, and under similar circumstances. 4. Diagnosed and recorded by independent registrars. 5. The equality of the cases is shown by the equality of the mean duration of their convalescence.

*Of the first series*—
- of 13 entered as typhus, 3 died;
- of 39 entered as typhoid, 16 died;
- of 56 of doubtful type, 3 died.

Of 108, total of continued fever, 22 died.

*Of the second series*—
- of 19 entered as typhus, none died;
- of 48 entered as typhoid, 2 died;
- of 39 of doubtful type, 2 died.

Of 106, total of continued fever, 4 died.

Excluding from the first series 2, and from the second 1, who died within two days of admission, and gave therefore little scope for judging of the effects of

treatment, there remains somewhat less than 1 in 5 as the death-rate under the first treatment, and less than 1 in 35 as the death-rate under the second treatment. Therefore the second method of treatment is a powerful means of preserving life.

Details of treatment were given, and some remarks made on the action of emetics.

Dr. Weber said that, fifteen years ago, when he was a student at Bonn, the usual treatment of fever was by hydrochloric acid alone, without food. Fifteen drops of the diluted acid were given four, five, or six times a day. The mortality was about sixteen or twenty per cent., the cases being typhoid. The fever was, on the whole, more violent than here. Dr. Weber thought it would have been better to have made a comparison between the treatment by hydrochloric acid and no treatment.

Dr. Murchison had listened with much interest to Dr. Chambers' communication, inasmuch as the treatment recommended closely resembled what he had followed at the Fever Hospital during the last eighteen months. The treatment of typhus and allied fevers by the mineral acids was a very old one; it had long been the favourite treatment in many parts of Europe, particularly in Germany and Sweden. At the same time, he had not that implicit faith in it which Dr. Chambers appeared to have, and he must protest against Dr. Chambers' inference, that his treatment was calculated to prevent fifteen out of every eighteen deaths from fever. Dr. Murchison had employed the mineral acids, in conjunction with abundance of fluid nutriment, and wine when indicated, in upwards of 1500 cases of fever, and although he had often seen the most marked improvement (cleaning of the tongue, &c.), follow the use of the acids, his statistical results had been much less favourable than those now announced to the Society. He was convinced that, with more extended experience, Dr. Chambers would be compelled to modify his opinion. Dr. Chambers' statistics were open to several fallacies. 1. The cases selected for comparing the results of different plans of treatment had occurred at different periods, instead of at the same time. 2. In both series the form of fever had not been determined in a large proportion of the cases, and no details had been given to enable any one to judge of their severity. Many of the cases "of doubtful type" had probably been examples of simple fever, which was rarely fatal under any method of treatment. The results would be materially affected by the proportion of cases of simple fever or febricula in either series. 3. The rate of mortality in the first series, treated "on general principles," was far above the average mortality from fever in general hospitals, and hence it was not a fair standard of comparison. The total mortality in this series (including febricula) had been twenty per cent., for typhus alone twenty-three per cent., and for enteric fever no less than forty-one per cent. 4. The ages of the patients suffering from the different forms of fever had not been given. Age exercised little or no influence over the rate of mortality of enteric fever; but in the case of typhus, the results of different methods of treatment could never be satisfactorily compared without taking the ages of the patients into consideration. Under twenty years of age typhus was rarely fatal; above fifty, the mortality was nearly sixty per cent. 5. The number of cases was too small to warrant any decided opinion as to the advantages of the treatment recommended. The second series included only nineteen cases of typhus and forty-eight of enteric fever, diagnosed as such. A practitioner, with extensive experience in fever, might often have under his care twenty cases of typhus in succession, without losing a single case, but then if he lost five cases, the mortality would be twenty per cent. During last autumn, of forty-one successive cases of enteric fever, under Dr. Murchison's care, only two died, one from perforation of the bowel, and the other from acute tuberculosis—lesions not likely to have been cured by any treatment—yet the rate of mortality for the entire year had been considerably greater. Most of the forty-one cases had been severe, but in none had a drop of hydrochloric acid been administered. Dr. Murchison doubted if the hydrochloric acid possessed advantages over the other mineral acids. Although he believed that the treatment of continued fevers by the mineral acids, together with a uniform system of nourishment, was justified by our knowledge

of the pathology of fever, as well as by experience, he was confident that Dr. Chambers' statements were calculated to make those who heard them too sanguine as to the results to be obtained from it.

Dr. Chambers, in reply, said that all statistics were open to the objections raised by Dr. Murchison—that they were not long enough. His statistics were not brought forward as conclusive, but as a help to further inquiry; and he would grant that it might be found that the mortality was slightly different if further series of cases were compared, but not so as to affect the practical conclusion. His reason for bringing forward the two series of cases, the subjects of the paper, was, that being equal in number, and being pretty much under the same circumstances, they were fairly comparable. The difference in the mortality might be due, it was said, simply to a general difference in the mortality of the fever, at the two quinquennial periods; but he had found that the mortality from fever in the two periods was as nearly as possible equal, taking Dr. Murchison's statistics as his authority. He did not bring forward the cases to exemplify the acid treatment, but rather as evidence of the value of continuous nutriment. In fact, he believed that the acid was beneficial principally in a subsidiary manner—in preparing the digestive mucous surface for the nutriment. That it did thus produce a beneficial change was evident from the clearing of the tongue. In reply to Dr. Waters, the author said that wine was given in both classes, but only in cases in which it was strongly required, on account of the expense. The treatment in Germany by acids was not successful from being relied on solely, and not supplemented by nutriment.—*Lancet*, May 16, 1863.

14. *Fevers of the South-east Coast of Africa.* By Chas. J. MELLER, medical officer of Dr. Livingstone's exploring party.—Although the time spent in the Rovuma, Zambesi, and Shiré rivers, has been too short to enable one to form statistics, or tabulate results of practice, I am able, from the number of cases we have had, to select the more salient points of the fever common to all the rivers; and to point out the principles of treatment in the typical form and varieties. To know the fever in its different forms, it would be necessary to study it in the reputedly healthy and unhealthy parts of the river, at different times of the year. This we have not been able to do.

We were only in the Rovuma a short time—March, and part of February, 1861—and left it, from finding it rapidly falling. Probably, we entered it just at the end of the rainy season. Before leaving it we lay by a mangrove swamp, for five days, procuring wood. A few cases of simple fever had occurred, attributable rather, I think, to exposure to the sun in boats than to malaria; but whilst we were lying by these mangroves, a more severe form rapidly spread amongst us. The patients were first attacked with griping and vomiting; followed by headache, hot skin, and the usual symptoms of the second stage; or by exhaustion to syncope, long continued rigors, or profuse sweating, without cold or hot stage. The system seemed to have suddenly received a poison of such sedative power that partial collapse ensued, reaction from which was, in two or three cases, procured only after stimulants had been frequently administered. Griping being an unusual concomitant, we looked for some cause to account for it; and thought we had found it, on observing that the water flowing by the ship, and which we had been drinking, came from a creek in the mangroves, and was exceedingly impure from the amount of vegetable matter floating on, and held in suspension in it. Within the five days, but four out of the whole number of white men on board (twenty) escaped. To avoid further infection and bad consequences, we left the river as quickly as possible, carrying, however, so much fever with us that all the sailors but one remained in the sick-list incompetent for duty for nearly a fortnight afterwards; and there were but two or three who had returned to duty when we reached Johanna on the 8th of April. An incubatory process must have existed after leaving the river; for several who were not affected severely while in it, were great sufferers at Johanna, and on the way to the Zambesi, which we reached on May 1st, having left Johanna April 22d.

The following three months, which are reputedly the healthiest, were spent in the Zambesi and Shiré; and the mild character of the fever we had would

seem to confirm this opinion. For the sake of studying the fever, the year may be divided into three seasons, wet, hot, and cold. We entered the Zambesi at the commencement of the last, which old residents have considered the healthiest with respect to fever, though in its place we have skin-diseases and congestive disorders prevalent. It embraces the months of May, June, and July; then succeed two months when diarrhœa and dysentery occur, and fever is more severe. The rains begin in September or October; and when they are well set in fever almost disappears, unless it be brought on through undue exposure to wet and damp, or sleeping in wet clothes. The rainy season may end in January or February, earlier or later, according to the time of setting in; but these months include the range. The two months that precede and follow this season are the unhealthiest. Fever is most virulent in those that follow, when the marshes and lagoons are drying up, and miasmata from decomposing vegetable matter are evolved. During the wet months, in place of fever, we have affections common to moist atmosphere in all countries, boils, prickly heat, catarrhs, etc.; and some special to the river—œdema of the feet, and a peculiar eruption resembling herpes zoster.

It first appears in the axilla and inguinal regions as slight elevations of the cuticle, with a zone of pink erythematous blush. There is great itching; on the second day a vesicle forms; on the fourth or fifth this becomes a pustule with thin milky pus, which has a peculiar odour. Desquamation occurs on the seventh day, leaving behind semilunar or oval patches of the surface, slightly elevated; or, after the first appearance of vesicles, the subcutaneous tissue becomes infiltrated, and of a condition that, at first sight, resembles that of phlegmonous erysipelas. The vesicles coalesce; the part becomes much swollen and very tense; there is no throbbing nor pain; and itching is constant and very troublesome. Or a few pustules may form on the chest and neck; and red swellings appear in different parts of the body, generally over the elbows and patellæ. The health suffers just before the eruption; and whilst it continues, the appetite fails, the tongue is coated white, leaving marks of teeth-pressure; sometimes there is diarrhœa. If the eruption continue long, an anæmic look follows; œdema of the feet, if present at the commencement, becomes worse. The treatment has included alkalies, alteratives, and tonics; saturnine lotions to erythematous patches; and warm clothing. The œdema is always confined to the feet and legs. There is nothing in the state of the urine to account for this condition; nor, in fact, would the attention be drawn to the swelling were it not from the difficulty that is soon experienced in putting on boots. Dysentery in a mild form has occurred in the hot and wet months; it has yielded to alteratives, ipecacuanha, and careful diet. Diarrhœa is common at all times; most so in the cold months. This may be from the great alternations of temperature that occur during the night—a difference of as much as 35° being frequently registered between 12 and 6 o'clock A.M.

The fever of the Zambesi, as found by Dr. Livingstone in 1858, was described as of the sthenic intermittent kind. That, however, of the last year has rarely assumed this character, being generally of the asthenic remittent type; when intermittent, being only so for a short time, and always resolving into remittent. As it was first observed in 1858, the paroxysm was sudden; there were few premonitory indications; the patient had chills and rigors, with headache, pain in the temples, and aching of the loins. In the hot stage, there was complete stoppage of secretions; the headache became more and more severe; occasionally there was delirium. The tongue did not always change with the progress of symptoms: it might remain healthy-looking through this stage. It was when these symptoms are established that the Livingstone specific must be given, if the first stage had been allowed to pass without its administration. The composition of this powder is the following: Rhubarb, gr. x; resinous extract of jalap, gr. viij; calomel, gr. iv; quinine, gr. iv. This quantity used to be given in five pills, with the view to relieve the *primæ viæ* quickly. Quinine was given about an hour after the pills, and continued every two or three hours, in five or ten grain doses, to cinchonism. The greater the deafness produced, the greater was the assurance of speedy restoration.

Generally the force of the attack was spent by the full action of the pills;

and it was not uncommon for the patient to resume his occupation on the third day after that of the attack. The exceptional cases were those in which the fever had been brought on by exposure to wet or sun, and the treatment had been delayed; or in which obstinate vomiting was present. Quinine was continued in five-grain doses until perfect restoration was secured, when the ordinary three-grain dose, taken with coffee early in the morning, was resumed. The attacks were sharp, but short, quickly gave way to treatment, and left the patient apparently none the worse.

In the past year, however, the fever has taken a less active form; the symptoms have been less decided; the stages ill defined, or none; and treatment less efficacious. So irregular have the symptoms been, that the sthenic class is now the least often found; very rarely is the intermittent form met, and, when purely so at the onset, it soon becomes remittent. The symptoms may be classed, according to their regularity and force, under three heads: 1. Those of the sthenic form of fever, in which they are most highly developed and defined: 2. Those of the asthenic form, where no order is followed—a prolonged cold or hot stage, or absence of one stage altogether, ending in great exhaustion, relieved only when full perspiration is procured; 3. The ephemeral—a mild form of the sthenic, in natural sequence, and lasting but a short time without any complication. The sthenic form is that generally met with in first attacks, and answers to that described by Dr. Livingstone in his letter to Sir James Clark in 1859; but the treatment has not been so successful in producing rapid cures. The purgative "specific" has had to be repeated frequently before relief came; and when this has been necessary, and time been lost, the cure has been by so much delayed; so that, in place of three days, we must say seven, as the average time of each patient on the sick-list. Headache has always been the last symptom to leave; and, so long as it has lasted, large doses of quinine have been continued.

But when the patient has had frequent attacks, the stages become less marked, and the symptoms less amenable to treatment. The premonitory symptoms are ill defined. The fever may be ushered in by the patient feeling chilly, or as though currents of cold air were passing over the spine; or there may be a distinct rigor. This state may be continued for twenty-four hours, or alternate for that or a longer time with headache and heat of skin. There may be no cold stage at all, or no hot stage; or the paroxysm may consist only of alternations of the two; the headache, pains in the loins, and languor, meanwhile increasing. There may be vomiting from the outset; when this occurs, the case is always tedious. Or the cold stage may be so prolonged, that reaction is with difficulty induced. The tongue may be foul, or clean throughout; but relief will not be afforded until the secretions are restored healthily, and free perspiration procured. The symptoms may be so few and undeveloped that they are scarcely noticeable; a man who has had fever frequently will only be able to appreciate them for what they prognosticate. If left alone, they recur again and again, gradually prostrating the patient, and ultimately merging into the remittent form when they have almost exhausted the strength of the victim. It is in the insidious progress of these symptoms that the opportunity is lost of treating actively. The first symptoms may be merely giddiness, and a feeling of languor, not calling for more than a stimulant. If they recur, the same remedy is used with quinine. But, though relieved, the patients are not cured; they become jaundiced gradually, and sickly looking; and now the tongue for the first time may become foul, though, unless there be other evidence of hepatic derangement, it is as often clean and pale throughout. And now, when the system has already become debilitated, the difficulty arises in the treatment, as the means taken to relieve the liver, whether mild or active, cannot be depended upon to relieve the system thoroughly, as in the sthenic type of the disease. The liver may be relieved; but generally relief is not obtained, and the prostration becomes greater the oftener this form of medicine is administered. It is generally in this condition that vomiting sets in, frustrating every attempt to push in sustenance or medicine.

The oftener a patient suffers in this way, the more sputious and irregular is the process of the fever. The intervals of attacks never permit him to resume

work long; headache and giddiness, loss of appetite and sleep, keep him constantly ailing. He seems to be only cured so long as he is under the full influence of quinine. Large doses have been given to patients suffering in this way—ten or twenty grains every day, so long as the slightest indication of the approach of an attack existed, or the symptoms from the last one had not entirely disappeared. But, though lessening the severity, they have never warded off an attack, nor lengthened the intervals between the paroxysms.

It is not unfrequent that after sthenic fever, a patient may, after regaining health, suddenly lose appetite and sleep, and have pricking sensations through the skin, with constipation or diarrhœa. These, if allowed to take their course, or if only treated individually, resolve into periodical returns, and, progressing in development, assume the remittent form. In treating each symptom as it arises (when pointing to functional disorder in any organ) specifically, antiperiodic doses of quinine are given; and, should this combination of treatment prove ineffectual, it has been found best to treat for the removal of vitiated secretion, and restoration of healthy action in the liver and any other organ affected; following with quinine to cinchonism, and continuing its use in large doses almost to cinchonism until every symptom shall have disappeared. As a rule, this treatment is sufficient; but, when a patient falls into this form of fever, he is in a low condition of health, pale, and dyspeptic. Vomiting may set in at any time, and, if it be long continued, will delay the cure; for until the remedies can be retained, and the secretions restored in healthy form, no permanent relief can be expected. Generally, when vomiting is severe, there is jaundice, sometimes with pain over the hepatic region. So soon as medicines can be retained, a large dose of calomel and jalap is given. In addition to large bilious evacuations by stool, the urine is frequently found deeply tinged by bile.

The same complications may occur in the process of the sthenic form. The liver, though relieved at first, may suffer blockade a second time; jaundice may be universal in a few hours, with tenderness over the liver; or there may be complete arrest of the secretion: and, when this amounts to suppression, the circulation becomes clogged; the heart's action is troubled, and frequently a mitral *bruit* is heard; and there is a feeling of weight at the præcordia. As the functions of the liver and emunctories are restored, the heart's action becomes more natural; but *bruits* have remained until the strength and flesh have been made good. In two cases, an anæmic condition remained after treatment had reproduced healthy action of the liver and kidneys. If a loud *bruit de diable* was heard along the course of each jugular, as well as a loud mitral murmur, both gradually disappeared as health and strength returned.

In the asthenic variety, a murmur has commenced with the earliest symptoms, and has progressed and faded away with them. Indistinct at first at the heart's apex, it has grown more defined, being accompanied when loudest with a *bruit* along the jugulars; and it has died away as it commenced. But, in its progress, the heart's action is troubled; the patient feels oppression and distress in the region of the heart; he cannot sleep from the continuance of these sensations, and finds it difficult to lie on either side with comfort when there is *bruit de diable* along both jugulars. The cause of this may be found in the anæmic state into which patients rapidly fall after long continued spurious fever, or after long continued sthenic, in which the treatment has been active, and heroic doses (twenty grains of the specific, repeated three or four times in the course of twenty-four hours) have been used. Corroborative of this view, we find frequently œdema of the lower extremities, without any indication of renal disorder, blanched skin, small weak pulse, and tendency to syncope.

After many attacks, the spleen frequently suffers. Attention is first directed to it by pain and tension beneath the ribs, simulating, from its suddenness and acuteness, pleuritic affection. Percussion and auscultation will soon define the limits of the enlargement, as the spleen presses forward immediately against the cartilages of the lowest ribs, and the anterior edge forms a distinct prominence.

As sequelæ, may be mentioned intractable diarrhœa; headache, general, or hemicranial, or over the brow; vertigo; and, in the asthenic, œdema of the legs.

Ulcers form from the smallest abrasion, and will not heal until the general tone be improved.

There is a modification of the symptoms of this fever: it is simply the mildest form of all the stages in natural sequence. It does not require the active treatment of the sthenic, but it must be at once combated with the usual means in smaller doses; and quinine must be continued to cinchonism. If neglected, it will recur as intermittent; soon, however, becoming remittent. Those who have been longest resident in the country have these slight attacks. The strength is very slightly affected by them. The treatment is based on the principle that the *primæ viæ* must be relieved and healthy secretion restored before any permanent good can be effected. With this view, the composition of jalap, calomel, and rhubarb, is given at the outset, and repeated again and again, until the secretions are fully relieved, and restored to healthy characters. In obstinate cases, other drastic purgatives are combined, until thorough purgation has been effected. Recovery is tedious and protracted in proportion as this object is quickly or tardily achieved.

But in asthenic cases, where the stages are irregular, and where there is often difficulty in inducing reaction after a fitful, long continued cold stage, the purgative is given in smaller doses with a stimulant; and (if there be no vomiting) reliance is placed in producing as quickly as possible the full influence of quinine.

Complications of vomiting, headache, pains in the renal region, loss of rest with extreme restlessness, are treated by ordinary means. A full dose of morphia given after purgation, often relieves all these symptoms and induces sleep, from which the patient awakes almost restored to health.

As to the virtue of quinine as a prophylactic, I can, from watching its influence on our small party, give only negative conclusions.

1. It cannot be depended upon, in any dose to avert an attack; though it would seem that, if given in a large dose on the first approach of symptoms, it will lessen the severity of the paroxysm. We have given every morning for a year past a dose of three grains with a little wine or rum; the rum because early morning is a very cold time during the greater part of the year, and cold and misty during May, June, and July, and the men seem to require a stimulus at this more than any other time. But, though this practice has been religiously persevered in, fever has not been warded off; in fact, it has been less frequent with some of those who have been longest in the country, and who refused to take the quinine regularly, than with the latter arrivals, who have never missed taking the morning dose.

2. In addition to the morning dose, large additional ones have been given to men who have been frequently attacked, when they have felt indications of an approaching attack—ten, twenty, or thirty grains at a dose; but the paroxysm, though mitigated (as compared with that when no quinine has been given) in severity, has never been warded off.

3. Some of the expeditionary party have almost entirely abstained from taking quinine for a year or so past. These men have not been more liable to fever; and, when attacked, have not suffered from any more severe form than the rest. These men, however, have never refused quinine during fever, knowing that they cannot hope for safety until they shall have been cinchonized.

4. During the two months when the boats of H.M.S. *Gorgon* were up the river (which must be considered an unhealthy period, as the rains had ceased earlier than usual, and marshes were drying up), there were 12 men left at the mouth of the river, who took no quinine nor fever; whilst of the 54 men who went up in the boats, and who were regularly taking it with a double ration of spirits, 6 only had escaped fever on their return to the sea, and of these six men one alone had escaped a month later. Of the complement carried by the *Pioneer* (22) but two escaped. Those, however, who were left at the mouth of the river had the advantage of sea-breeze (which set in for the greater part of the day) during the whole time the rest were absent. Of 39 *Gorgon* men, who went seventy-four miles up the river and returned after thirty-two days, 34 had fever. Of 15, who were sixty-one days up river 14 suffered. These men, for the greater part of the time, had ordinary ship's rations, with extra rum, given

with a daily dose of quinine. It was observed that those men who were young and active were more immune than the older, more feeble, or indolent.

5. It might be thought that three grains for an habitual dose were too small to test the efficacy of the remedy, and that no satisfactory result could be obtained from it. But very large doses have been given, as before said, with no more satisfactory result; in fact, we have had to invalid one man who had constantly taken these large doses, and from whom the fever was never averted.

There are circumstances that modify fever. Though in the rainy season there is less of the disease than at other times, the form is more severe, because an attack is always brought on by the patient becoming thoroughly wet, or from having slept in damp or wet clothes.

The excessive irritation from mosquito bites will keep up fever, in spite of all treatment. The loss of rest occasioned will unfit one for the day's duties; appetite is lost; and headache sets in. A harsh diet of coarse native grain and foods will often throw the system into disorder, producing headache, dyspepsia, etc., and probably predisposing the body for the reception of malarious poison.

The consideration of these points may indicate the best means for prevention. Care should be taken to insure a dry sleeping-place, and warm dry clothing for night use. A good mosquito curtain should be provided. Each person should on rising take some strong hot coffee. It is essential that a generous mixed diet be had so long as river work continues. The time of year best suited for river exploring or other work is the rainy season; but this only holds good so long as there is thorough protection from the rain. But for open boat work it would be very unadvisable to try this time of year, and much better to take the dry cold months of May, June, and July; for though one travelling in these months would be more subject to diarrhœa and congestive disorders, from the changes of temperature between night and morning, fever attacks would be comparativly mild.

There can be no doubt of the malariousness of these rivers, and that immunity from the diseases specified cannot be guaranteed, however sedulously precautions and sanitary measures be carried out; but from the large number of cases occurring amongst the men who have been resident long enough to test the climate, and be tested, and the small percentage of death—one only having occurred in the *Pioneer* during the last twelve months—there can be no doubt that the fever *per se* is of a mild disposition, perfectly amenable to treatment when taken early, and dangerous only when left to take its own course.—*British Med. Journ.*, Oct. 25, 1862.

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15. *Diseases of the Skin developed in Schools, Workhouses, and Factories, from Defective Hygiene.*—Mr. T. Hunt read before the Epidemiological Society (Feb. 2d, 1863) a paper on this subject. He stated that he wished prominently to bring forward the effect of congregating and incarcerating many children or young persons under one roof, of feeding them on one and the same diet, and thus promoting locally the more or less permanent inroads of certain cutaneous diseases, which diseases often subside spontaneously upon the removal of the sufferer from the locality. These diseases are chiefly the common ringworm (*porrigo sentulata*) and scabies, the former being usually aggravated by the presence of a vegetable, the latter by an animal *parasite.* He had never visited a workhouse, or a detachment of pauper children, or a large boarding-school occupied by the poor, without observing many cases of ringworm and scabies; one of these two diseases prevailing at one time, the other at another period, and both showing a tendency to pustulation. These cutaneous plagues will often persist month after month, in spite of the most careful treatment and the most scrupulous attention to cleanliness and ventilation. He had already published an account of an endemic scabies which infected, for many months together, a large girls' school in the neighbourhood of London, where cleanliness, ventilation, good drainage, good nursing, and good medical care were conspicuously apparent. But nothing was of any permanent service until an entire change of diet was introduced, together with the daily exercise of the inmates away from the premises. Accounts of similar endemic difficulties reached the author from medical practitioners who had the charge of institutions of the

same character in different parts of the country, and the same kind of treatment proved equally effectual in all of them. In those factories where children are employed, and *boarded* and *lodged* on the premises, like occurrences are observed, involving the clean and the dirty, the well-fed and the ill-fed. The doctrine of contagion fails to explain the cause; nor, indeed, is any one imaginable cause to be named that is capable, *per se*, of accounting for all the peculiarities of the case. But it appeared to him, that by duly reflecting upon *all* the sanitary circumstances in which these children are placed, we may be able to discover an aggregate of influences, so to speak, which not separately but concurrently may combine to produce these morbid conditions. Atmospheric impurity, unnatural diet, deficient exercise, and contagion, are the four conditions which appear to unite their several forces to perpetuate these loathsome affections of the skin. And yet not one of these causes alone ever presents a formidable difficulty in the treatment; neither do any of them exist in any prominent degree in these establishments. There is no sensible vitiation of the atmosphere, no bad smell, no defective drainage, no neglect of ventilation. The diet is excellent in quality, plentiful in quantity, wholesome in character, and correct in its chemical elements. Exercise is allowed and encouraged within the walls of the institution, and contagion is for the most part antagonized by care and cleanliness, and often by individual segregation. So that, considered apart, these causes of disease exist, if at all, in scarcely an appreciable degree. And yet, together, they are capable of establishing a most formidable cachexia. They poison the blood, producing not only their immediate effects in the form of parasitic skin disease, but laying the foundation probably of more serious disorders, manifested in after life by the presence of lumbrici, ascarides, tapeworm, pediculi, fungi, hydatids, tubercles, and perhaps cancerous germs, in the various organisms which, under morbid changes, become capable respectively of nourishing these distinctive parasites. The author then considered the causes referred to singly, and of sameness of diet he said: There is a daily dole of potatoes with boiled mutton, or potatoes without boiled mutton; there is the eternal pea-soup or oatmeal gruel, with so many ounces of bread, and so many grains of salt. Oh, what a luxury would a red herring be to those poor creatures, or a lettuce, or an apple, or a dish of greens, or carrots, or turnips. Man was made capable of living upon a *variety* of food, animal and vegetable, fish, flesh, fowl, root, leaf, stem, fruit, and seed. But no man can live on bread alone; no, nor on mutton chops alone, nor on any two or three articles alone. The life supported by half-a-dozen changes only is in a feeble, imperfect, half-poisoned condition. It appeared, then, to the author, that these four causes, atmospheric impurity, sameness of diet, insufficient exercise, and contagion, all of them trifling in degree, are yet capable of working together for evil, and may thus become powerful agents in the promotion and perpetuation of disease. The blood becomes vitiated from the unvarying character of the diet, from impure and stagnant air, from deficient perspiration, and restricted activity of limb, and the agents of contagion triumph over the low degree of vitality which results. If this be sound pathology, these combined evils will probably be found to play a busy part in the production or aggravation of other diseases, endemic or epidemic in their character. Fortified by an ample, generous, and varied diet, free ventilation, active exercise, and cleanly habits, our junior population might set at defiance cholera, diphtheria, dysentery, and typhus, and probably half the physical "ills which flesh is heir to."—*Med. Times and Gaz.*, March 21, 1863.

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16. *Diphtherial Nerve Affections.*—E. H. GREENHOW read a paper on this subject before the Royal Medical and Chirurgical Society (March 24th, 1863). He began by stating that the epidemic sore-throat, which, under the name of diphtheria, had latterly engaged so much attention, was well known to be followed by nervous phenomena of a peculiar kind. These consisted chiefly of impaired, excessive, or perverted sensibility, together with more or less complete paralysis of the muscles of the fauces, pharynx, tongue and lips, extremities, trunk, and neck; the frequency of the occurrence of these symptoms in the several sets of muscles being nearly in accordance with the order in which he

had placed them, the first-named being the most frequently and the last the least frequently affected. The author had had the opportunity of watching the course of several cases of these diphtherial nerve affections in patients under treatment at the Middlesex Hospital, and the present paper was in a great degree based on those observations. He did not mean to infer that every attack of diphtheria was followed by some of these secondary nerve affections, for he had seen patients recover perfectly without experiencing any of them; nor to assert that their intensity was always proportioned to the severity of the primary disease, for he had sometimes seen them follow comparatively mild attacks of diphtheria. Nevertheless, as a general rule, he had certainly observed these nerve affections to be more frequent after the worst cases of diphtheria, and to bear some proportion even to the local severity of the attack; he had noticed, for instance, that the paralysis and anæsthesia were sometimes more complete on that side of the fauces which had been most severely affected by the primary disease. The author had found that a brief period of convalescence—generally not exceeding a few days, but in rare cases extending to weeks—almost always intervened between the disappearance of the sore-throat and the accession of the nerve symptoms; and cases had fallen under his notice in private practice in which patients who had recovered sufficiently from diphtheria to be sent from home for change of air, had subsequently fallen into a helpless condition from diphtherial paralysis. The fact of this interval seemed to him important, inasmuch as it went far to show that the paralysis could not be entirely attributable either to the albuminuria which so often accompanies the acute stage of diphtheria, or to the anæmia which closely follows it, as patients had often got rid of the former symptom, and had even begun in some cases to regain flesh and strength, before the accession of the paralytic symptoms. The author had observed that these nerve affections do not at once attain their maximum of intensity, but are progressive even in the same sets of muscles; and also that if several of the sets of muscles which he had enumerated should be attacked in the same individual, they do not become affected all at once, but in succession —the faucial or pharyngeal muscles being the first to suffer, and so on in the order in which he had placed them at the beginning of the paper—though it by no means followed that all of them should be affected in any one case. He had found the muscles of the fauces by far the most frequent, as well as the earliest, seat of nerve affections after diphtheria, and had seen them attacked in many cases in which the rest of the muscular system either entirely escaped or was very slightly affected. When the fauces were paralyzed, the soft palate lost its natural action, the speech often became imperfect, and liquids regurgitated through the nostrils. These symptoms should be discriminated from the hoarseness of voice and return of fluids through the nostrils which often occur during the acute stage of diphtheria, and arise, as in ordinary quinsy, from the swollen and painful state of the fauces impeding the natural action of the parts. Anæsthesia had co-existed with the paralytic affection of the fauces in all the cases that had come under the author's notice, so that these naturally very sensitive organs became altogether callous and insensible to touch. Next to the affection of the fauces, impairment of vision, probably due to paralysis of the ciliary muscle, appeared to be the most frequent of the nervous disorders consequent on diphtheria. The author had observed that the pupil of the eye became dilated, and acted sluggishly under the influence of light a day or two before the sight became sensibly impaired, and often remained so for a time after the sight had been regained; also that patients unable to read with unassisted sight could do so with the help of convex spectacles; and hence he attributed the impairment of sight to a temporary loss of adjusting power. The nerve symptoms which he had noted in the tongue and lips were, formication, or a sense of scalding, numbness, and impaired taste and power of movement. They began, for the most part, in the lips and the tip of the tongue, and gradually extended upwards towards the dorsum and root of the latter organ. The limbs had suffered more or less, in all the five cases which formed the basis of the paper, from paralysis and anæsthesia, besides tenderness and abnormal sensations, such as coldness, formication, and a feeling of constriction in the fleshy parts, as if they were tightly bandaged. These affections began either first in the upper,

or at the same time in both the upper and lower extremities, and were at their commencement peripheral, extending gradually upwards from the tips of the fingers and toes towards the trunk and in some cases affecting the lower part of the back and of the abdomen. He had found that pressure over the sciatic and median nerves was sometimes attended by acute pain, and that pressure of the instep between the finger and thumb sometimes caused convulsive starting of the leg and foot, as well as pain. He had observed that the paralysis in some cases assumed a more or less hemiplegic character, but had seen no instance in which, one side being paralzyed, the other remained entirely unaffected. The author had seen nerve-affections after diphtheria of a graver character than any of those exemplified in the present group of cases, and several even fatal cases had fallen under his notice in private practice. In three of these latter, death was caused by failure of the action of the heart, and in one by exhaustion from vomiting. He believed, however, that such cases were fortunately exceptional, and that the great majority of sufferers from diphtherial nerve-affections, under good management, sooner or later recovered their usual health and strength. The author had satisfied himself that these cases were best managed on sound general principles. Generous diet, and a liberal allowance of stimulants, together with rest in bed, he believed to be always necessary. Tonics, especially steel and quinine, or the mineral acids, he had found useful from the first appearance of the nerve-affections; and after the complete development of the paralytic symptoms, nux vomica and strychnia had proved in his hands most valuable remedies. Subjoined were the five cases on which most of the remarks in the paper were founded.—*Med. Times and Gaz.*, April 4.

17. *Suppurative Aortitis: its Influence in producing Purulent Infection.*—M. LEUDET, of Rouen, has published a paper on this subject, which, though the observed facts are as yet few, is of some importance. In 1829, M. Andral, in his *Précis d'Anatomie Pathologique*, described an abscess existing in the coats of the aorta. The correctness of his interpretation of what he saw was, however, long doubted; and Rokitansky suggested that a softened atheromatous deposit had been mistaken for an abscess. On the other hand, Virchow, in 1847, stated that he had been on the point of supposing an abscess to be a softened atheroma, until microscopic examination revealed the presence of distinct pus-corpuscles. In 1852, Spengler published the first case in which the clinical history had been ascertained. The patient, after exposure to cold, had subacute articular rheumatism; then, after being again exposed to cold, he had general symptoms of thoracic and cardiac inflammation, followed by symptoms of purulent infection. At the post-mortem examination, there was found to be ulcerative endocarditis, with an abscess between the coats of the aorta opening into the heart. In 1856, Dr. Schutzenberger communicated to the Strasburg Medical Society the history of a man who was recovering from pneumonia of the left lung, when he was attacked with violent rigors occurring at irregular intervals, copious sweating, and a peculiar yellow tint of the skin and sclerotic. At the autopsy, an abscess of the size of a nut was found, which had formed between the external and middle coats of the aorta, and opened into that vessel. M. Leudet has also observed a case similar to those related by Spengler and Schutzenberger. In all three, abscess was at the origin of the aorta; but this is not always its seat, for M. Leudet refers to two cases noticed by Rokitansky and Lebert, where the collection of pus was higher up in the vessel. Suppuration may also, in place of being idiopathic and primitive, be a consecutive result of the deposition of atheroma. In the cases collected by M. Leudet, the pus was collected in a small cavity in the external cellular coat, and was infiltrated into the middle elastic coat. These two coats, especially the external, presented marked vascular injection. Fine capillary vessels sometimes extended into the thickness of the middle coat, but never reached the inner coat, which most generally was not at all coloured. In no case were false membranes or clots observed at the level of the inflamed artery. The pus presented the ordinary characters of this secretion. The large opening by which the abscess communicated with the vascular canal had no doubt introduced a small quantity of pus into the blood during life. The existence of pyæmia was denoted by the simultaneous presence of

abscesses in the liver, lungs, spleen, etc. In M. Leudet's patient, there was meningitis; in Rokitansky's case, abscess of the spleen; and Spengler's patient had hypostatic pneumonia. The study of the symptoms of suppurative aortitis is rendered very difficult by the coincidence of numerous lesions, which may mask the peculiar symptoms of the disease. The first stage of the disease is one of inflammation, probably simply exudative, of the coats of the vessels or of the heart. This inflammation is generally intense, as appears from the results of post-mortem examinations. It is that form of endocarditis which M. Bouilland terms phlegmonous, in opposition to superficial; he compares the first to phlegmonous, and the second to simple erysipelas. Nothing in the symptoms of the cases appears to have led to the suspicion of so intense an inflammation. After the manifestation of symptoms which may be supposed to denote the presence of exudative inflammation, there is a kind of remission, which is, however, far from constituting complete convalescene. These symptoms of purulent infection set in—especially rigors. This symptom may lead to a diagnosis, when no inflammation can be discerned elsewhere, especially in the venous system.—*British Med. Journ.*, Feb. 7, 1863, from *Arch. Gén. de Méd.*, and *Gaz. Méd. de Paris*, Dec. 20, 1862.

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18. *A Contribution to the Pathology of the Crura Cerebri.*—Dr. Hermann Weber related to the Royal Medical and Chirurgical Society (April 28, 1863) the following case:—

"A man, aged fifty-two, affected with disease of the aortic valves, hypertrophy of the left ventricle, and rigidity of the larger arteries, had, during the last years of life, frequent tinnitus aurium, a dull but moderate headache, disturbed sleep, and anxious dreams. Two months before death, there occurred sudden paralysis of the *right side of the body* (limbs, trunk, and face) as to motion and sensation, and of the muscles of the *left eye* supplied by the third nerve, with dilatation of the *left* pupil; disturbance of vision only slight—viz., imperfect double vision when using both eyes combined, and impaired accommodation when using the *left* eye alone; the other special senses and the intellectual faculties unaffected; slow and irregular pulse; obstinate constipation; increased temperature in the paralyzed limbs. The paralysis of the right side of the face, the soft palate, the tongue, and the trunk, had been from the beginning less complete, and became gradually much diminished, as well with regard to motion as to sensation; that of the limbs, on the contrary, remained almost complete with respect to motion, while the sensation gradually improved. The paralyzed muscles of the left eye regained their function only very imperfectly; and the left pupil, too, remained much dilated. The obstinate constipation continued. About eight days before death, symptoms of broncho-pneumonia and pleuritis, especially of the right side, came on. Death took place two months after the seizure.

"*Post-mortem examination.*—Phenomena of recent broncho-pneumonia and pleuritis occupying the greater portion of the right lung, and existing only in a very limited manner in the lower lobe of the left lung. Hypertrophy of the left ventricle of the heart, with disease of the aortic valves (rigidity through atheromatous deposit, stenosis of the orifice, and insufficient closure). Extensive atheromatous affection of the arterial system, and especially of the cerebral arteries. Hemorrhage into the inferior and internal portion of the left crus cerebri, the cavity being about six-tenths of an inch long, and five-twentieths of an inch broad, and as deep; it was situated close to the surface, and in immediate contact with the third nerve, the nerve-fibres of which were degenerated. The tissue of the crus round the cavity was hardened in the thickness of about one-fifteenth of an inch. The remainder of the left crus and the other portions of the brain were normal.

"Dr. Weber remarked that the diagnosis in this case had been comparatively easy. The sudden paralysis of the right side of the body, with paralysis of the third nerve of the left side, and with immunity of the mental faculties and special senses, pointed unmistakably to an affection near the base of the left hemisphere, and in immediate connection with the third nerve, therefore also the crus cerebri. The fact that none of the other cranial nerves were affected indicated that the

morbid condition was confined to a small spot, and the existence of the disease of the arterial system recognized during life rendered hemorrhage more probable than any other alteration. Dr. Weber thought under similar circumstances an almost accurate diagnosis might be always ventured.

"The author then gave an account of the two only cases of an analogous nature which he had met with in medical literature; the one related by Andral (*Clinique Médicale*, tome v. p. 339, 1834), the other by P. H. Green (*Medico-Chirurgical Transactions*, vol. xxv. p. 195), the main symptoms of both cases being in accordance with those observed by himself. He then touched upon the symptoms produced by section of the crura cerebri in animals, especially the circus movements described by Magendie, Lafarque, Longet, Schiff, and other physiologists, the absence of hemiplegia, and the occurrence of hyperæsthesia on the side of the lesion noted by Schiff. Dr. Weber did not endeavour to explain the discrepancy between the results of vivisections and the symptoms of disease in man. He alluded, however, to the differences in the pathological and experimental lesions themselves, and also in the connection of the different portions of the brain between themselves in man and animals. He wished by no means to disregard the results of the physiological experiment; but, on the contrary, thought that whenever any discrepancy existed, we ought to be very cautious in drawing inferences from pathological observations. He therefore did not consider as certain, but only as probable results of lesions of the centre, the internal and lower portions of the crura cerebri in man (the only parts which were diseased in the three cases related): 1. Almost perfect paralysis of the limbs of the opposite side as to motion, and great impairment as to sensation. 2. Less complete and more transitory paralysis of the opposite side of the trunk, of the face, soft palate, and tongue, as to motion and sensation (leaving the muscles of the eye intact). 3. A similar, but perhaps more permanent, impairment of the pneumogastric and sympathetic nerves of the opposite side. 4. A great retardation in the functions of the intestinal canal. 5. Immunity of the intellectual faculties and special senses. 6. Paralysis of the third nerve on the side of the lesion, if the latter affects the nerve substance adjacent to the point of issue of that nerve.—*Lancet*, May 16, 1863.

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19. *Prolonged and Profound Sleep.*—Dr. J. W. COUSINS records (*Med. Times and Gazette*, April 18, 1863) the following remarkable example of this:—

"A farmer, æt. 43, has been subject at intervals during the last twenty years to attacks of deep and prolonged sleep. He has never suffered from any disease of the brain, or any other illness. The disorder commenced without any assignable cause in the year 1842, and continued nearly a whole year. It returned again in 1848, and having persisted without interruption for eighteen months, it left him entirely for the space of twelve years. The present attack commenced on May 19, 1860. Since that time he has not slept naturally.

"He retires to bed at night soon after 10 P.M., and almost immediately falls into a profound sleep, from which all the means at present adopted have failed to arouse him. He generally sleeps on his side, and appears like a person in refreshing slumber. His face and ears are pale; skin generally warm; but the feet are often cold and livid. Pulse slow and feeble; pupils generally somewhat dilated; respiration very gentle and shallow. He seldom moves, but occasionally he turns over from one side to the other. He never snores or moans. He awakes suddenly, without giving any warning, and he always seems refreshed, just as if he had slept naturally. Occasionally he complains of a slight pricking sensation in the forehead.

"The longest period he has ever passed in profound sleep is five days and five nights. Lately, he has frequently slept three days, and occasionally four without waking, but the average time is nearly two days. He is awake about four or five hours out of forty-eight. During these remarkable sleeps he never dreams, and the contents of the bowel and bladder are always retained. Before he falls asleep, he says that he "sometimes feels stupid;" but this is the only head symptom he ever complains of. His memory is good. When he awakes he remembers everything that happened the day before he began to sleep, and always asks, 'How long have I slept?'

"Lately, he has looked pale, and has lost flesh. His appetite is good, and the bowels are active. His manner is quiet and his disposition amiable. He is a good man of business, and is fond of reading. In intellectual power he is by no means deficient, but his early opportunities have been limited.

"During the attack in the year 1848, he frequently suffered from spasmodic trismus, which generally commenced soon after he awoke, and persisted for many hours. His jaws were always firmly locked, and at the same time he complained of pain in the back and neck. This affection, however, has never reappeared."

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20. *Incubation of Hydrophobia.*—M. RENAULT informs the Academy of Sciences that during the last twenty-four years he has, at Alfort, made numerous experiments for the purpose of learning the period of incubation of hydrophobia in the dog. During that period, 131 dogs have, under conditions (which he describes), been either bitten by mad dogs under his own observation, or have been inoculated by him with the foam as immediately collected from the mad animals. Of this number, 63 having presented no signs of disease during the four subsequent months, were not further observed. Of the 68 others, the hydrophobia was developed at various periods, as shown in the following table:—

| | | | |
|---|---|---|---|
| In 1 dog | between the | 5th and | 10th day. |
| 4 dogs | " | 10th and | 15th day. |
| 6 " | " | 15th and | 20th day. |
| 5 " | " | 20th and | 25th day. |
| 9 " | " | 25th and | 30th day. |
| 10 " | " | 30th and | 35th day. |
| 2 " | " | 35th and | 40th day. |
| 8 " | " | 40th and | 45th day. |
| 7 " | " | 45th and | 50th day. |
| 2 " | " | 50th and | 55th day. |
| 2 " | " | 55th and | 60th day. |
| 4 " | " | 60th and | 65th day. |
| 1 dog | " | 65th and | 70th day. |
| 4 dogs | " | 70th and | 75th day. |
| 2 " | " | 80th and | 90th day. |
| 1 dog | " | 100th and | 120th day. |

*British Med. Journ.*, Feb. 21, 1863.

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21. *Action of the Hypophosphites of Soda and Lime, the so-called "Specific" for Tubercular Diseases.*—Dr. R. P. Cotton has instituted some experiments with these boasted specifics of Dr. Churchill in consumption, at the hospital for consumption, Brompton, and relates (*Lancet*, Nos. for April 25th and May 2d, 1863) 12 cases in which he employed those articles. The following are his conclusions:—

In taking a general review of these 12 cases, it should be remarked in the first place that they were, with only two exceptions (Nos. 1 and 2) of a promising class; for if either an unpromising or hopeless set of cases had been selected for the experiments, it might reasonably have been urged that the hypophosphites had not had a fair trial. Of the twelve patients, six improved more or less under treatment; and in six the disease progressed. Of the six unimproved cases, two improved in a greater or less degree under subsequent treatment; whilst each one of the six cases which underwent improvement did just as well, and, in at least two instances, apparently better, under equally simple treatment. In every case the greatest care was taken to observe the *immediate* effect of the phosphatic salt, and in no one instance was Dr. Churchill's statement that "from the very first day there is frequently observed a remarkable increase of nervous power," &c., verified. No particular effect, indeed, seemed to accompany its use; and in no case was the substitution of the simple mixture of carbonate of soda and syrup attended with any alteration in the symptoms, and only once was such a substitution detected by the patient. Whenever the change was

made it seemed to matter nothing, so far as the disease and its symptoms were concerned, whether the patients were taking the one mixture or the other.[1]

If there existed even the minutest *specific* action in the hypophosphites, it would surely have exhibited itself in some way or other in the course of these experiments. Even in the two unpromising cases (Nos. 1 and 2) we might fairly have looked for at least an amelioration of some one or more of the symptoms; whilst it is only reasonable to expect that any "specific" relation between the hypophosphites and tubercular disease would have been rendered apparent when, in some of the other cases, the *hypophosphite* of soda was exchanged for the *carbonate*.

I have no hesitation in declaring my conviction that the hypophosphites of soda and lime have not the slightest *specific* action in tubercular diseases, and that the benefit which may sometimes follow their employment is solely attributable to their simple, unirritating, and alkaline properties. I believe, indeed, that in the soda and lime dwells their chief if not their only usefulness. In this conclusion Dr. Risdon Bennet, in the paper to which I have already referred, perfectly coincides. In the few cases in which he found the hypophosphites serviceable he attributes the benefit to the abandonment of tonics unsuited to the irritable condition of stomach in the particular cases, and states his belief that "*The patients would have been as well with a little lime-water, citrate of potash, or any other equally innocuous agents.*"

Phthisis is ever different in its character and symptoms. Some cases need tonics, some require only the most simple treatment, whilst others seem to yield as well if not better to good plain diet and sanitary conditions than to any kind of medicine. I have over and over again kept patients for weeks together under no other *medicine* than a simple mixture of gentian and hydrocyanic acid, combined, according to special circumstances, either with soda or a mineral acid; and I have known many such patients leave the hospital with all their symptoms arrested, and calling themselves "cured." Yet no one, I should imagine, would on that account give the title of *specific* either to gentian, soda, or a mineral acid. There is no medicine, however potent or however mild, which might not be called *a specific for consumption*, if only a certain number of cases be taken into account, and if the many circumstances which may have conduced to their improvement be either carelessly or wilfully overlooked.

Some time back I met with a physician who assured me that he had seen the very best effects from the hypophosphites. Upon inquiry I found that he had been in the habit of prescribing either the hypophosphite of *iron* or *quinine*, or both of them together. Such a trial I deem most inconclusive. We know that both the *citrate* of quinine, and the *citrate* of quinine and iron are also excellent remedies in many cases of consumption; but it is clear that it is to the base and not to the acid of these salts that their good effect is due. It is no more the *hypophosphorous* acid in the one instance which is beneficial than it is the *citric* acid in the other.

My recent experience of the hypophosphites is not limited to the twelve cases I have described. I have tried both the hypophosphite of lime and of soda in seven or eight other hospital patients, special notes of whose cases were not taken. In one of these, in which dyspepsia was a prominent symptom, I *commenced* with the carbonate of soda and syrup mixture, under which for three weeks the patient rapidly improved. The hypophosphite of soda was then taken for three successive weeks with continued improvement; after which steel was administered with equal advantage. In this case not the slightest difference

[1] The following statement upon these points is from a note by Dr. Rutter, the resident clinical assistant at the hospital: "In the advanced cases the disease progressed apparently not in the least affected by the hypophosphite. In more favourable ones, different degrees of improvement took place during its exhibition, but in none of these was the change for the better greater or more rapid than is commonly effected in such cases by the hygiene of the hospital, aided perhaps by other medicines. Cases which were improving under the hypophosphite continued to do so in an equal degree when a mixture made of simple syrup with a little bicarbonate of soda was substituted for it."

was observable with the change of treatment; a similar effect and equal benefit seemed to follow each of the remedies, and if the title of "specific" were due to the hypophosphite, it was equally deserved by the carbonate of soda and the steel. This was, in fact, a simple case of consumption, the type of hundreds of others, in which the most simple treatment is the most successful, and in which rest and improved diet, with proper hygiene, are the chief agents for good. In the remainder of these cases the general results were the same as in those I have detailed, the phosphatic salt invariably exhibiting itself as a simple, unirritating substance, adapted like many other simple alkaline salts, to certain varieties of consumption, but having not even the shadow of a claim to anything like "*specific*" influence upon tubercular disease.

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22. *Action of Phosphoric Acid upon Phthisis.* By R. P. Cotton, M.D.—Phosphoric acid has been so long and successfully used as a tonic and antiseptic, especially in cases of depressed nervous power, that some good result might reasonably be expected from its administration in many cases of phthisis. With a view of testing its influence, I prescribed it, as in my previous experiments, in twenty-five cases of chronic and uncomplicated consumption, and carefully noted the results. Of these twenty-five cases, twelve were in the first stage, four in the second, and nine in the third stage of the disease. Fifteen were males and ten females.

Three patients experienced great improvement whilst taking the phosphoric acid, eight improved a little, and fourteen of the cases seemed either to derive no benefit or to become worse. None of them increased materially in weight, the greatest increase not exceeding two pounds, except in one instance, where seven pounds were gained, but in this case it was afterwards found that cod-liver oil had been taken in addition to the phosphoric acid.

Two of the greatly improved cases were in the third stage of the disease, and it was generally observed that most of the improved were either in an advanced condition of disease or belonged unmistakably to what is commonly understood as the cachectic class, leading to the conclusion that the phosphoric acid acted simply in virtue of its general tonic and upholding influences, and not from any specific action upon the tubercular disease.

It was prescribed in doses of fifteen minims of the Acidum Phosphoricum dilutum of the London Pharmacopœia, in a little water two or three times a day. As a general rule it agreed very well with the patients, improving the appetite and diminishing undue secretion, whether from the skin or mucous membranes. In four cases, however, it was discontinued, seeming to produce griping pains in the bowels, together with nausea and diminished appetite.

In estimating its effects, even in the most satisfactory cases, it appeared to me that the improvement was inconsiderable in comparison with what had previously been noticed in some other remedies; whilst several of the patients who either improved very slightly or doubtfully under the phosphoric acid, improved afterwards under other treatment. Four of the patients improved greatly in health when steel wine was taken in conjunction with the acid, the latter being given twice a day, and the former immediately after dinner. It will be remembered that a combination of steel wine with quinine was formerly found to be productive of good in a considerable number of cases (*Medical Times and Gazette*, August 30, 1862).

Upon the whole, I confess to having been disappointed in the action of phosphoric acid taken singly. In some cases, however, where it has been prescribed either with other tonics or in chemical combination with iron, I have found it of great use in the treatment of phthisis.

From these observations I have arrived at the following conclusions: 1. That the dilute phosphoric acid acts beneficially as a tonic in certain consumptive cases; but that, as a general rule, it is inferior to some of the other mineral acids. 2. That when taken in conjunction with iron its good effects appear to be considerably enhanced.—*Medical Times and Gazette,* May 30th, 1863.

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23. *Therapeutical Value of Cod-liver Oil in Chronic Convulsive Diseases.*—Dr. Anstie read a paper on this subject before the Western Medical and Sur-

gical Society, Feb. 20th, 1863. The author's attention had first been directed to cod-liver oil as a remedy for affections of this class in consequence of his obtaining some years ago an unexpected success with it in a case of chorea, which had resisted all the ordinary modes of treatment. The convulsive diseases in which the author has employed cod-liver oil are paralysis agitans, simple epilepsy, chorea, and mercurial tremor, and in all these affections it has appeared to be more constantly useful than any other medicine. Of paralysis agitans, four cases were detailed, of which three were very decidedly improved, and one of them may have been said to be cured, although the affection had been very severe. Of chorea, one case was detailed, and others were alluded to, in which the benefit produced was very marked. Of mercurial tremor, one most remarkable case was related, in which the cause of the mischief was a very unnecessary salivation inflicted by medical authority some thirty years previously; the patient was attacked immediately afterwards with dreadful tearing pain in the muscles of the forearms and calves, and with violent muscular tremors, and ever since that time she has been liable to a recurrence of the symptoms when much fatigued or depressed from any cause. On application to Dr. Anstie, at the Chelsea Dispensary, cod-liver oil was prescribed and persisted with for five weeks, at the end of which time all the symptoms had perfectly disappeared, the patient declared that she had never been cured before in less than six or eight months, and she doubted whether any other medicine than the oil had ever really done her any good. Twice since she has had slight recurrence of the symptoms, but a short course of cod-liver oil has on each occasion given complete relief. Of simple epilepsy, twenty cases were given, in which the treatment had been confined to the use of cod-liver oil. Of these there were five upon whom no good effect whatever was produced; seven had completely recovered; two had disappeared from supervision at a time when they were rapidly improving, although they could not be said to be cured; in two others the mental symptoms had greatly improved, but the fits remained as before. Four patients remain still under supervision; in two fits have ceased, although there are still frequent prodromata; and in the remaining two but little good has yet been effected. Besides this general summary of results, Dr. Anstie detailed the particulars of three cases which from their severity might be said fairly to test the remedial power of the oil. The patients were respectively a girl, aged 17, a boy, aged 13, and an infant, aged 7 months; in all of them the fits were very frequent and severe, and the nervous system exhibited signs of great depression. The case of the infant was specially noticeable, because it was proved by microscopic inspection that the milk of the mother was very deficient in oily matter, and it appeared that in a former infant of the same mother precisely the same train of symptoms had appeared, and had terminated fatally. In all these three cases the treatment had proved perfectly successful, and the author commented strongly on the fact that in all these cases the general nutrition of the body had been excellent, and only that of the nervous system had appeared deficient, and said that the conclusion appeared inevitable that the oil had expended itself in enriching the nervous centres. This, indeed, was the principal point of the paper. The author directed attention to Dr. Radcliffe's remarks on the necessity of fat to the nutrition of the nervous centres, and mentioned the fact that that gentleman had found cod-liver oil of the highest value in the treatment of convulsive diseases. He observed, also, that the beneficial action of cod-liver oil was quite consistent with what we know of the action of the few other remedies which careful therapeutical investigation has credited with a really beneficial action in chronic convulsive diseases. Steel, arsenic, quinine, all these may fairly be spoken of as foods. With regard to sedatives, the author remarked that in the first place the good effects which could be expected from them were chiefly temporary, and such as result from breaking through for a time the evil habit, so to speak, of convulsive action. Secondly, and this was most important, there was strong reason to believe that it is not the really narcotic effects of these remedies which are of service in preventing or arresting convulsive action, but merely the stimulant effects which can be obtained from small doses; for there is no class of remedies which is more useful in preventing or arresting convulsions than the pure stimulants. The author

concluded his paper by deprecating strongly any return to the absurd system of hunting about blindly for "specifics" for chronic convulsive diseases. The progress of clinical observation was blasting the reputation of one after another of the strange, out-of-the-way remedies which had once been accepted with the blindest faith, and was pointing unmistakably to a rational treatment of convulsive diseases by means of medicines whose action it is possible to understand. —*Med. Times and Gaz.*, March 28, 1863.

24. *Hydrochloric Acid in Typhoid Fever.*—Dr. Henderson, Medical officer to the Chinese Hospital, Shanghai, records the occurrence of pure typhoid fever amongst the natives of Shanghai during the months of November and December, 1862, and claims great success in his treatment of it by hydrochloric acid. He believes that in typhoid fever the effect of hydrochloric acid is as decidedly beneficial and specific as that of quinine in ague. He explains the good effect of the acid by reference to the excess of amonia given off from the body during destructive metamorphosis of the tissues, and argues from the fact that ammonia injected into the veins of animals is capable of producing symptoms of a typhoid character. The same line of reasoning, we may observe, was several years ago taken by Dr. Richardson. A form of dysentery, also of a typhoid character, occurs at Shanghai. In this disease Dr. Henderson found the blood to be more alkaline than in health, and again the acid treatment was followed by the very best results.—*Medical Times and Gazette*, May 30th, 1863.

25. *Ozœna.*—Dr. Oliffe relates (*Revue de Thérapeutique Medico-Chirurgicale*, May 1, 1863) a case of this very intractable affection, successfully treated by injections of a solution of permanganate of potash. He employed the injection every three hours for some weeks, alternating the permanganate of potash with the chlorate of potash to the interior and by injections.

## SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

26. *Gunshot Wounds by Modern Weapons.*—A. Neill, Assistant Surgeon 65th Regiment, has published (*Edinburgh Medical Journal*, 1863) some very interesting observations on these injuries.

"Gunshot wounds," he says, "have been written about ever since gunpowder was discovered; and wounds caused by a leaden bullet are treated of by Celsus previously to the introduction of gunpowder, the characters of which were very similar to those of the present day, but of course not of so severe a character. Bones and arteries were seldom injured, and the wounds were generally contused and lacerated, owing to the small amount of impetus given to the ball. *Deaths* from these leaden bullets were not frequent, and the imaginary poisonous effects of the introduction of the lead into the tissues seems to have occupied more of the attention of the surgeon in an endeavour to counteract its influence, than the more serious effects of the wound itself. Even so far back in the annals of medical and surgical history as the time of Celsus we read of the most approved plan of treatment to be followed in the case of wounds from leaden bullets, the correct mode of discovering them, with the after-treatment of the wound, which in those days must have caused more misery and suffering than the infliction of the injury itself; and I have no hesitation in saying that a patient had a much greater chance of losing his life under the surgical treatment of his wounds than by any direct injury done to his body by the bullet itself. Of course, the first thing the surgeon did was to remove the foreign body, which was generally imbedded in the soft tissues; then he proceeded to enlarge the external wound, under the supposition that the poisonous effects of the lead would escape from the system with the loss of blood. Then numerous and varied hot poultices were applied—almost every surgeon having his own

favourite form of it—in which lay some subtle virtue for the extraction of the poison from the wound. Plasters of different sorts, and various healing cataplasms were used. The wounds were encased in these filthy messes, and the process of suppuration speedily setting in, the pus not being allowed a vent, and the contact of clean water or fresh air being considered most prejudicial, can we be surprised at the deaths that resulted from these forms of treatment? The crowded state of the hospitals of those days, the want of attention to proper ventilation, the intolerable stench of the putrid discharge from their wounds, not removed more frequently than once a week at the oftenest, and the inevitable result of this, the formation of maggots in the wound, induced those forms of low fever by which we have lost so many fine soldiers, and which swept off the unfortunate creatures by scores.

Very little alteration in the treatment of gunshot wounds was made until the commencement of the Peninsular war, and even during the early part of it the same mode of treatment was pursued; but owing to the great losses of men from deaths in hospitals having occasioned some inquiry into the treatment of wounds in general, it was resolved to abandon the system previously in vogue, of invariably making the wound larger than it was by incision, and instead of the hot poultices and dirty plasters, to adopt the more sensible plan of cooling applications. And as it was found that the patient's general health was injured by having his wounds always saturated in the pus discharged from them, instructions were given to endeavour to keep the parts as clean as possible, and to change the dressings "more frequently" than once a week. Since then great advances have been made in military surgery, and we now appreciate the absolute necessity of avoiding over-crowding in hospital wards, of paying great attention to proper ventilation, of keeping the wounds well washed in cold spring water, and never allowing any offensive smell to arise from the collection of pus, thus conducing to the patient's comfort and general health, which formerly were never studied. The consequence of this mode of treatment is, that we now have cases of men recovering from wounds almost always looked on formerly as fatal. We seldom or never hear of hospital gangrene, or any of those diseases created in the wards of an hospital where a number of cases of wounds discharging pus are under surgical treatment.

In the present day our missiles of defence and offence consist of the rifle and bayonet, smooth-bore gun, pistol, cannon of various calibre and formation, calculated to throw either round shot, or cylindrical shot, or shell percussion, as in the Armstrong gun, or with a fusee, as the old gun. Then we have the mortar and cohorn, for a vertical fire, to use an artillerist's expression, calculated to throw shell. Then for the smooth-bore cannon there is the solid shot, the grape shot, and the canister shot, which in their names express their form of composition. Bar shot are two large shots welded together, with an iron bar between; and chain shot, with a chain between two large shot, which are calculated to mow down like a scythe, making fearful wounds. The two latter are used chiefly against bodies of horse, and on shipboard. The shrapnel shell is a hollow sphere of iron, filled partly with gunpowder, and partly with pewter or iron balls of small size. The common shell is an iron sphere filled wholly with powder. The musket ball is round and solid, of lead. The rifle bullet is an elongated, expanding, cylindrical, conoidal projectile, as the musketry instructors tell us, weighing about one ounce, and calculated to travel an immense distance, and at a very great rate. The wounds caused by cannon shot and shell are fearful, and those by the rifle bullet, though not so severe to look at, are often most dangerous. It is a difficult thing to judge which form of weapon is the most destructive of life. Against masses of troops the cannon is no doubt very efficacious; but then, at certain ranges, the rifle is equally so. The characters of the wounds inflicted by these various missiles are equally varied. Shot and shell tear away large portions of the body; and I have seen legs and arms stripped off, one half of the chest quite cut away, and the body cut in halves by cannon balls. Shell generally, by exploding in fragments, either impact themselves in the tissues, making wounds frightful to look at in extent, or merely cut away portions of the body. The wound of the rifle bullet is, of course, very small, and apparently very innocuous compared with the large-shot wounds, but

they are just as efficacious in the destruction of life. To give an illustration of the force with which a cannon ball must travel, I may mention that I saw a case where a man had all the ribs, both clavicles, and one arm fractured by attempting to catch and stop a round shot, which was apparently spent, and was rolling along the ground in an innocent manner. He caught at it, and was thrown down, struck on the chest, and the shot rolled over, leaving him in articulo mortis. In this case a portion of fractured rib had passed through the pericardium, and wounded the substance of the heart. What are called spent rifle balls are capable of inflicting much and severe injury, and always make an extensive bruise. To show the effects of being hit with a spent ball, or one that has lost its greatest impetus, I may mention a case that came under my notice, where a colonial volunteer was standing talking in a group of his comrades during an action, and was struck by a ball in the abdomen, over the region of the bladder. The ball fell on the ground at his feet, without either injuring his clothes or even marking the skin. He did not feel much pain at the time, and walked to the hospital a distance of two miles, with the ball in his pocket, without feeling much pain, but he died shortly afterwards from peritonitis and extensive inflammation of the bladder. The entire surface of the abdomen presented the appearance of a severe bruise in a few hours after being struck. I could mention several other cases more or less bearing on this point, but they only help to prove the fact, that a spent ball can kill without wounding the integument, and show how small an amount of injury will often take away life; but, on the other hand, it is wonderful how great an amount of injury the human system can endure without succumbing under it. Both legs may be shot away, with great loss of blood, and amputation be necessary afterwards; yet, with such mutilations, death is not always the result.

One of the first peculiarities of gunshot wounds to be mentioned is, the shock to the system, which is generally present in a greater or less degree; but it is not always the case that in very severe and dangerous wounds the amount of shock is very great. I have seen some instances of comparatively trifling wounds where the extreme prostration of the vital powers seemed to indicate much injury, but on examination discovered no dangerous wound, or even great loss of blood. The shock does not always bear a marked relation to the severity of the injury; it seems to depend greatly on the constitution of the patient. To his mental powers and his physical conformation may be ascribed many of the anomalies we observe in this state of the nervous system. Ballingall has noticed this in his excellent work on *Military Surgery*, and ascribes it to the same causes. However, it is an undoubted fact that when a person feels himself wounded, let his self-possession and his coolness be what it will, he cannot help feeling an irresistible tremor and nervous agitation, even though it lasts only for a few moments. In some persons the power over the feelings is brought under the domination of the will, and consequently such people speedily regain their self-possession, and will submit to any operation, or endure any amount of pain, without changing even the expression of their countenances. To the suddenness of the injury, and the uncertainty of the amount of danger to life which is sustained on the instant, and when the mind has been engaged in some other manner, and perhaps in a high state of excitement at the time, may be ascribed this peculiarity; and in which instant the reason can see nothing but extreme danger. The amount of the shock to the system is to be observed and studied, and is of immense importance in determining as to the performance of any operation at the time of the injury, or deferring it until some other period when the nervous system shall have recovered its power, and the mind its equilibrium.

It is a matter of serious import to us when we have a patient on the field who has received a wound which we know requires the performance of some capital operation, such as the removal of a limb (and who is at the time in a state of complete shock, which of itself is sufficient to destroy life), to determine what to do in such a case. The nature of the injury, its situation and extent, must be the first inquiry, and a hasty opinion formed in the mind as to its probable result, so as to determine the question of immediate operation to save life, which may be ebbing fast from loss of blood or shock. It is advisable, if possible, to

defer any capital operation till the patient be removed to a more suitable operating theatre than the open field; and it requires no small amount of nerve and decision of character to enable the surgeon to contemplate calmly the necessary steps to be undertaken when in action.

Gunshot wounds of every variety are classed in the Army Medical Reports, under the heading of Vulnus sclopitorum, though they might with more propriety be subdivided into simple and compound. The mere *flesh wound*, caused by the passage of a ball through the soft parts without involving injury to bone, artery, or nerve, being one subdivision; and the more *complicated* injury, where fractures of bone and other dangerous lesion has occurred. Gunshot wounds are sometimes classed as mortal, dangerous, severe, and slight—each of which bears its explanation in its name. The characters of a gunshot wound are those of a contusion and laceration of all the tissues. Sometimes they are so simple as to bear resemblance to a punctured wound, particularly if a rifle ball, revolving on its long axis, has passed through the soft part at a great speed; but within a few hours it resembles a contusion. The wound of entrance, as it is termed, bears no comparison in either size or shape to that of exit when a rifle ball has caused the injury. In the former you see the edges of the wound curving inwards, and its circumference small, with little or no hemorrhage. In the latter the wound is large, with torn and irregular edges projecting outwards, and perhaps only slight oozing of blood. In a short time, averaging an hour, around the entrance wound slight redness begins, gradually extending to about two inches around its orifice. Again this colour changes to blue or greenish black, and you see all the appearance of a severe bruise, with a small wound of the skin, its edges still curved inwards. In the exit wound the discoloration of the skin is not apparent. Inflammation quickly sets in throughout the whole course of the wound, and suppuration more or less profuse follows, with sloughing of the injured tissues. During this stage secondary hemorrhage is to be looked for, if in the course of the missile an artery has been injured or approached too closely; but loss of blood from a wound of this description is not frequent. Pain is great in the injured part, and much increased by motion of the limb; cicatrization throughout the whole course of the wound sets in, and in this manner heals. By care, and with every circumstance favourable to recovering, a patient may soon be going about once more, and have no ill effects from a wound such as I have described. Great loss of substance in the tissues is also well marked, induced by the suppuration of a slough more or less extensive.

The treatment to be pursued in a case such as I have described is very simple; the wound must be examined and sponged, any foreign body, such as shreds of clothing, &c., removed, and in suitable localities uniform pressure may be applied; in a simple wound union by the first intention may be induced by closing the orifices and applying slight pressure by bandage, with attention to the position of the limb by giving it complete rest. In one case I saw this result well marked, where the ball passed through the muscular part of the upper arm in its anterior aspect. The wounds were immediately closed from contact of air by isinglass plaster, and a bandage applied. The arm was supported in a flexed position, and cold water abundantly used to keep down inflammation. The orifices of the wound were quite healed, and the arm in use ten days afterwards. In a similar case, where a different plan of treatment was followed, suppuration set in, and the arm was useless for three months. With water, either cold or tepid, I have seen many almost miraculous cures effected. I consider that in cases where the vitality of the soft parts has been partially destroyed by bruise, tepid water and lint are very necessary as assisting to bring back the vitality, after which cold water may be applied with much benefit. In cases of compound fracture of the long bones with gunshot wound, after the limb has been put up in splints and bandages, cold water will prove the best application, kept constantly dripping over the wound, which must not be closed over by either splint or bandage, but so arranged as to be quite exposed to the water. In seven cases of this description, four were gunshot wounds with fracture of the humerus, in three of which the ball passed out, and in one the ball was lying in the bone and was at once extracted. In these three the arm was put up in the

usual manner as for fracture, but leaving the external wounds exposed. The patients were kept in bed with the arm flexed and so arranged, that a constant stream of water was kept trickling over it, carrying off the pus discharged. A pail was made and raised over the bed, with a tube so placed as to carry a small stream from it to the limb, and regulated so as to change the temperature of the water occasionally if needful; one case was fracture of the tibia in its lower third, and one fracture of both bones of the forearm, with two external wounds. In the former case the man was aged 24 years, and three months after recovering was killed accidentally. On dissection of the leg I found that the fracture had extended down to the joint of the ankle, and both pieces of bone were joined perfectly—the mark of union was most distinct. In all these the plan of treatment by cold water was adopted with successful results.

In fifty cases of gunshot wounds, including all descriptions, treated thus by local applications, a successful issue was obtained. Gunshot wounds of the head and face generally terminate fatally, but if no very serious lesion of the brain occurs, much may be done to save life in the treatment. I have noted one case where a man was shot in the head; the ball entered the left eye, and passed into the brain from below upwards; the patient was aged 21 years, of good general health, and of abstemious habits. He was found apparently in articulo mortis; great hemorrhage had taken place, his face and hair being covered with blood. I washed away the blood, and gave him weak brandy and water in small quantities. He was unconscious, and his pulse was scarcely perceptible. After getting the stimulant, his pulse gradually got stronger, and he seemed more conscious, though not able to speak. In four hours I looked again at the wound; blood was oozing from it, and a substance resembling that of the brain itself. His pulse was now small and rapid, and he was quite unconscious and unable to swallow. He had croton oil dropped on his tongue; his head was shaved; cold water was kept trickling over; the stimulant was stopped. The eye was quite destroyed, and was removed on the second day; after which time he seemed to improve, but still remained unconscious. Soup was administered by the stomach-pump every day. The only topical application was lint and cold water. It is needless to follow out this case. The patient gradually recovered; the bullet being somewhere in the brain, having no doubt become encysted. The only remarkable thing that occurred in this case was, that paralysis of the right side of the body occurred, the opposite to that on which the ball entered. His general health is good, and he has never had convulsions or epilepsy.

Gunshot wounds of the cavities of the body are always dangerous, but not always fatal. In one case of a soldier the ball passed through the right side of the chest, fracturing one rib, and passing through the lung out at the back near the spinal column. The same man was shot in the left breast, the ball not passing out. This was a serious case. There was great cough, with expectoration of blood in large quantities; bloody froth bubbled out from both wounds; there was also much difficulty in breathing. The right side of the chest was fixed with broad strips of plaster, passed round from over the spinous processes of the vertebræ to the front part of the chest, leaving the wounds exposed; this side of the chest was thus prevented from moving, and gave the lung rest. The opposite side was merely covered with bandages. The patient was supported in a sitting posture. Cold water and lint were applied to the wound. He had muriate of morphia at night to give sleep, and his strength was kept up by nourishing soups. Purgatives were administered when required, and small doses of antimony, in the form of James's powder, were also given along with an expectorant mixture to allay cough. Three weeks after being wounded, and when going on well, he had a violent attack of congestion of the left lung, which was relieved by cupping. This man is now tolerably well, and is invalided from the service. In another case, where the left lung was wounded by the stab of a bayonet, and where the same plan of fixing the chest by plaster along with cold water applications was adopted, complete recovery followed.

Much attention must necessarily be given to position in the treatment of gunshot wounds. The head must be kept raised in wounds of the thorax, so as to relieve the breathing. Fixing the chest by means of the adhesive plaster gives

great relief to the breathing, and, as I know from experience, changes the condition from torture and extreme agony to comparative comfort.

In the limbs, wounds of the arteries and large nerves always require amputation; but when the artery alone is wounded, the only operation necessary is to cut down on and tie it. The treatment, of course, being—proper position of limb, complete rest, and cooling applications, such as the water dressing.

When a ball passes through the carpus or tarsus, even though much smashing of the bone takes place, without lesion of an artery, the member may be saved. In five instances of such wounds, three in the carpus and two in the tarsus, both hands and feet were saved by adopting the antiphlogistic plan of treatment with water dressing, and the removal of dead bone when it is loosened and acting as a foreign body. Occasional poultices are useful in cases of this sort so as to favour suppuration, being careful to keep them clean and frequently changed. The use of poultices in gunshot wounds is generally to be avoided. They are superseded in their effects by lint and warm water kept constantly trickling over the wound, and only induce putrefaction of the purulent discharge.

When bleeding takes place from a small artery, it may be stopped by the pressure of a bandage, which always becomes necessary when there is œdema of the part. In much smashing of the small bones, bandage and splint will, in a measure, maintain the shape of the foot or hand, which would otherwise become distorted. I have been induced to adopt as my treatment the topical applications of cold water, solely on observations among the aboriginal natives of New Zealand, where from time immemorial they always carry their wounded to the edge of some stream, so that a constant supply of water may be at hand; and in the case of fractured bones, after putting them up, they pour water constantly over the injured part, and many have been the cures that have been thus effected.

Much depends on fresh air as well as fresh water; however, the former is not always supplied in our hospitals, but the latter not so liberally as it should be in surgical cases.

Many and various have been the instruments constructed for extracting bullets. All sorts of forceps and with as many improvements and varieties as weeks in the year nearly; but I am sure all will concur with me, that with the common bullet-forceps any bullet may be extracted, and the only instruments needful for the field are tourniquets, with pad-strap and buckle, scalpel and forceps, with curved needle and silk thread, lint, adhesive plaster, and bandages. By the plan of treatment I have advocated I do not doubt that I have witnessed cures effected where death would have resulted under any other. The plentiful and constant applications of cold water to wounds (either gunshot or by the surgeon's knife) will heal them in a much shorter time and with less discomfort to the patient than any other treatment. Every surgeon has his own favourite plan of treatment, but none will ever supersede the cold water.

It is said that the Minié conical ball makes a more severe wound than the round, but not if it revolves in its long axis, as it then pierces the tissues, not tearing them; the least obstruction to its course will, however, alter its motion; and if it then revolves on its short axis, of course, by its greater length, will create a larger wound than the spherical ball.

Erysipelas is a frequent result of gunshot wound, and generally of a severe character, causing much sloughing in and around the soft parts, difficult to subdue and always to be dreaded when in a severe form. It often supervenes in cases where the shock has been great, and where a large amount of stimulants have been administered. In such cases, where it might be feared that erysipelas would set in, I have given potassio-tartrate of antimony in small doses, as soon as the shock subsided and reaction set in, thus anticipating the attack, if I may so say, and in no case in which it was administered have I seen erysipelas; but when it does show itself, the usual means of treatment must be adopted, and changing the form of local applications from cold water to warm. I have never seen a case of gunshot wound in which erysipelas set in, where the shock of the system had not previously been severe, though in two instances the wounds were slight. After amputation, acute bronchitis is to be feared, causing much danger to the patient. In seven cases of secondary and four of primary amputation,

I saw acute bronchitis attack the patients, generally commencing about the fifth day after operation, for which no reason could be assigned. The season of the year was in summer with fine weather, and the patients had every care taken of them previously. An attack of acute bronchitis supervening on an amputation or severe gunshot wound is of an aggravated type, and seems less amenable to ordinary treatment than the usual bronchitic affections, and as the purulent discharge from the wound is considerably diminished in quantity, when the first symptoms of the affection show themselves, and is through the whole course of the disease abnormally small in quantity, so, on the return of the pus in increased quantity, the bronchitis gradually disappears, and the wound assumes a more healthy aspect. This occurrence of bronchitis after amputation has been frequently remarked by authors, but I do not know of any cause for it being assigned by them, or any notice taken of the almost total disappearance of the purulent discharge during the attack. The ordinary remedies have been given for the treatment of it; but till the reappearance of the pus, little benefit seemed to be derived from the usual plan of treatment. Pyæmia is a frequent result of gunshot wounds, but it may often be avoided if proper precautions be taken. Tetanus is more frequently seen now than pyæmia; and for its cure most of the articles in the materia medica have at some time or other been proposed, but none seems of so much use as the continued use of opiates and chloroform.

In the course of treatment in gunshot wounds, diarrhœa and dysentery are very frequently most annoying to the patient, and reduce the strength very rapidly. In these cases I have found nothing so speedily beneficial as powdered charcoal in one-ounce doses, five or six times a day, and it has invariably checked the diarrhœa. Through the whole course of treatment, I have found that the tincture of the muriate of iron in small doses, twice daily, has been of much service, and has changed the appearance of the wound in a few days after amputation, when of an unhealthy aspect, to a fine healthy look, where the consistence of pus changed materially. I have given it in thirteen cases of gunshot wounds, from the seventh day for a period of about a month or six weeks, with the most satisfactory results. Of styptics in gunshot wounds the best is tincture of matico poured on lint and passed into the wound, when it has acted as a charm in allaying hemorrhage, and should always be in the pocket of the surgeon when in the field; but styptics are generally to be avoided, as they seem to induce attacks of erysipelas, or at least favour its production.

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27. *Remarkable Case of Injury of the Head, in which the Right Restiform Body and the Right Posterior Column of the Spinal Cord divided Transversely.*—Dr. A. T. H. Waters, of Liverpool, read to the Royal Medical and Chirurgical Society (April 28, 1863) the following case:—

John M'Bride, a sailor, aged twenty-three, was admitted into the Liverpool Northern Hospital about noon on the 19th of February, 1863. He had received a blow on the side of the face on the previous day from a capstan bar, which stunned him for a short time. On presenting himself at the hospital he was able to walk with assistance. When seen by the author he was in bed. He was quite conscious, understood everything, and spoke rationally and distinctly, although articulation was not quite perfect. He complained of slight dizziness of the head, and slight numbness of the right side of the face and of the right arm and leg. He was unable to swallow, and had constant hiccough. The face was dusky; the breathing quiet; the pulse 100, and regular; the tongue was protruded in a straight line; the uvula was drawn to the right side. There was partial loss of power over the right side of the face, and right arm and leg; both these limbs could, however, be readily raised. He could open and shut both eyes. The pupils were rather dilated; the eyeballs constantly rolling about. No affection of vision or of hearing was complained of. The right side of the face and the right arm and leg were of higher temperature than the corresponding parts of the opposite side. The patient said he could distinctly feel when touched on either side of the face, on either foot, leg, or arm. Sensation appeared slightly less perfect on the right side than on the left, *but on both sides it was good*. The patient died, somewhat suddenly, at five P. M. on the day of

admission, after an ineffectual attempt to swallow. He had survived the accident about twenty-four hours.

After death the cranial bones and the vertebræ were found unfractured. The cerebrum was healthy. There was a considerable quantity of slightly coloured fluid at the base of the skull and in the spinal canal; the venous sinuses were very full of blood; the right hemisphere of the cerebellum was slightly and very superficially lacerated on its under surface, close by the side of the right restiform body. The medulla oblongata at its posterior aspect and right side was the seat of an extravasation of blood lying beneath the pia mater. This extravasation was into the nervous substance, and was connected with lacerations of that structure. The parts having been hardened in spirit, two transverse lacerations were found connected by a vertical one. The first or superior laceration involved the right restiform body about its middle; the laceration extended to within a very short distance of the median furrow of the fourth ventricle behind; to the outer side and in front the laceration extended as far as the line of origin of the eighth pair of nerves. Blood was effused between the lacerated parts, and separated them from each other. The nervous substance in the adjacent parts was also infiltrated with blood. The median furrow of the fourth ventricle was pushed a little towards the left side. As far as it was possible to judge, this laceration involved the whole, or very nearly the whole, of the fibres of the right restiform body, and a portion of the gray matter spread out on the floor of the fourth ventricle. None of the roots of the eighth pair of nerves were torn; but the laceration extended close to the superficial origin of the glosso-pharyngeal and par vagum, and no doubt involved their deep fibres. The second or lower laceration was situated just below and to the right of the nib of the calamus scriptorius. It had divided that part which is known as the posterior pyramid and the tract outside of it, which is the continuation of the posterior column of the spinal cord. The laceration extended about two lines into the nervous substance; it stopped behind at the median fissure, and externally it did not extend beyond the line of attachment of the posterior roots of the spinal nerves. Blood was effused as at the upper laceration. These two lacerations were connected by a vertical one, which ran down along the inner side of the restiform body, and terminated below by joining the inner part of the lower laceration. The lungs were loaded with black blood. The heart was healthy.

The author remarked that the importance of the case was in the fact that the parts which were formerly supposed by most physiologists, and still are by some, to be the sensitive tracts, were divided on one side without loss of sensation ensuing. The case was remarkable as presenting us with a repetition in a healthy man of those experiments so often performed on the lower animals by the physiologist—namely, division of certain portions of the cord or medulla.

The results of the case tended to confirm the views recently advanced by some physiologists, that the posterior columns of the cord and the restiform bodies are not the channels by which the posterior roots of the spinal nerves communicate with the sensorium; and to refute the opinion that those structures are concerned in that function.

With regard to the minor symptoms, they for the most part agreed in a remarkable manner with the lesion which was found. So severe a laceration of the restiform body could scarcely happen without involving the deep origin of the facial, the glosso-pharyngeal, and the pneumogastric nerves. Hence the symptoms of paralysis about the face, &c., which had been referred to. The immediate cause of death appeared to have been a sudden arrest of the function of breathing.

Dr. Waters said that, with perhaps one or two exceptions, he was not aware that any case of a parallel character had ever been placed on record. The results of the case, as regarded the symptoms, did not in the slightest degree invalidate the views of Sir Charles Bell as to the function of the posterior roots of the spinal nerves, but they were quite in opposition to the theory that the posterior columns of the spinal cord and the restiform bodies were the tracts along which sensitive impressions were conveyed to the sensorium. The partial division of the gray matter on the floor of the fourth ventricle—generally believed to be the continuation of the central gray matter of the cord—without

any loss of sensation following on the side opposite to the lesion, seemed rather opposed to the view that decussation of the conductors of sensitive impressions takes place all along the spinal cord; for, although only a portion of the gray matter was divided on the right side, yet if the sensitive fibres decussate before reaching the medulla oblongata, the left side of the body ought to have had a diminished sensibility, whereas the opposite was the fact—sensibility was diminished on the right side. The existence of increased temperature on the side of the lesion was also an interesting phenomenon; this and the somewhat flushed condition of the face were symptoms somewhat similar to those which follow an injury to the sympathetic. The author alluded to a case reported by M. Begin, in Longet's *Anatomie et Physiologie du Système Nerveux*, where one antero-lateral column of the cord was divided by a sharp instrument, the posterior columns and the central gray matter being uninjured. In that case there was loss of power of the affected side, but no loss of sensation. The case he had reported, coupled with that of M. Begin, and taken with the experimental and pathological cases which have been already brought forward, seemed to prove beyond doubt that neither the posterior columns of the cord nor the restiform bodies were concerned in transmitting sensitive impressions. In conclusion, the author dwelt on the importance of a careful observation of such rare cases as the one he had related, which constituted, in fact, a repetition in man of the experimental inquiries so often made by physiologists. Such cases, when correctly observed, might serve to establish important physiological doctrines, as not being open to the objections which might be advanced against the results of vivisections in the lower animals, or the facts observed in disease in man.—*Lancet*, May 16, 1863.

28. *Treatment of Nasal Polypi by Bichromate of Potash.*—Dr. Frédéricq states in a communication to the Society of Medicine in Ghent, that he has successfully treated twenty cases of nasal polypus by means of bichromate of potash. A saturated aqueous solution of the salt is applied by means of a small brush to the parts of the polypus within reach, care being taken to avoid the neighbouring tissues. The operation may be repeated several times. It does not generally produce distress or pain; but, at the end of about three or four days, the polypus becomes the seat of a kind of inflammation which extends sometimes to the nose. It swells up, and a watery and slightly acrid fluid often flows from the nose. This inflammation, however, need not give rise to alarm; it never lasts above two days. When the irritation has gone off, the polypus will be found to have partially or entirely disappeared. When the first signs of inflammation appear, the application is suspended, and is repeated when the irritation has ceased. It is not uncommon to find polypi cured in five or six days, after a single application. Relapses are rare after treatment by bichromate of potass, in polypi as well as in syphilitic vegetations. The cases treated occurred in females, most of whom had passed their fiftieth year. The tumours varied in number, size, and shape; all were mucous except one, which was fibrous, and which did not appear to be radically cured.—*British Med. Journal*, Aug. 2, 1862, from *Annales de la Société de Méd. de Gand*, March and April, 1862.

29. *Conservative Tendency of Nature in Injuries.*—Mr. John Williams communicated to the Surgical Society of Ireland the following case, which strikingly illustrates the conservative tendency of nature in injuries:—

William B——, a healthy young man, 20 years of age, left England for Australia, to seek his fortune, in the month of November, 1860, in the ship *Queen of Commerce*. On the third day after sailing, while sitting on a "spree mast" which lay on deck, and which, he states, must have been badly lashed, a heavy sea struck the side of the vessel and coming over forced the former out of its berth, causing it to snap the ropes that tied it. Being thus loosened, it rolled across the deck, and throwing W. B. prostrate, passed over his lower extremities and nearly crushed him to death. Before I proceed further, I must premise that it is not obligatory on the owners of emigrant ships to provide surgeons for passengers if they be under a certain number—an *indulgence* essentially bad, and one that ought to be rescinded by the Board of Trade. When

he was removed to the cabin, it was found that "the right thigh bone was broken in the centre, the same hip injured, while the ankle of the corresponding limb appeared to have been sprained." *As there was no surgeon on board*, the precise nature of the injuries sustained by the right hip and left ankle-joint could not be known; but a kind and sympathizing fellow-passenger, a Mr. Young, set the broken thigh, as well as he was able, and, good Samaritan-like, watched and tended him carefully for the remainder of a voyage thus so inauspiciously commenced. During the greater portion of the passage, extending over three months, he was confined to his cabin, and inadequately can it be conceived what sufferings and inconveniences, caused by the rolling of the ship, and the great privations experienced by invalids at sea he patiently endured, while on reaching port he was again unhappily subjected to suffering little less in severity. When the *Queen of Commerce* reached Melbourne the precise nature of his injuries were ascertained. *The right femur, in addition to fracture of its shaft, had been dislocated into the sciatic notch, and Pott's fracture and dislocation of the left ankle sustained.* Let us for a moment reflect on the position of a patient in such a condition at sea, and far from surgical aid, and then contrast the termination of his case with the probable issue of one who had met similar injuries, but who enjoyed every assistance that eminent surgical skill could afford. It was deemed advisable by the medical men of Melbourne, to attempt, even after the lapse of three months, the reduction of the dislocation of the hip. Could it have been reduced when recent? For obvious reasons no interference could be made with Pott's fracture and dislocation of the left ankle. During the efforts made to dislodge the head of the right femur from the sacro-sciatic notch—a proceeding, I need scarcely remark, surrounded with difficulties when the dislocation is recent, not to speak of the late period at which it was then attempted—the femur snapped at the seat of the former fracture, thereby putting an end to all further endeavours at reduction, and consequently the head of the bone was suffered to remain in its new position. Being of a good constitution he again recovered without any bad symptoms.

From what I have related, the condition of this fine lad, the son of a clergyman, whose widow lives at present in Cork, can hardly be imagined. Buoyant with hope he left his mother and his home to seek support in a distant land; but ere the lapse of three days after sailing, all his expectations were for ever rudely blasted, and his life nearly forfeited. I reached Australia, having taken the voyage for the benefit of my own health, twelve months after he had met with these injuries, but was unaware of the fact until I received a request from his mother that I would find him out and ascertain the exact condition he was in. I accordingly did so, and my amazement may well be imagined, when I met him walking about the streets of Melbourne with the mere aid of a walking-stick in his hand. He walked lame, but not to the degree that may be expected in one whose right femur, in addition to having been twice fractured in the short space of four months, lay in the sacro-sciatic notch, and whose left ankle presented an unreduced Pott's fracture. His right leg was two inches and a-half shorter than the left, and the characteristic signs of dislocation of the head of the femur into the sciatic notch were present. The deformity of the left ankle was very great, and was evidently caused by dislocation of the tibia in addition to the fracture of the fibula. He occasionally felt great pain in the seat of the latter injury, and said it troubled him more than all the others, particularly if he walked much. The other symptoms he complained of were pain, referred to the new situation of the head of the right femur, which limb often became numb and dead, particularly if, when sitting, he crossed it on the corresponding one. He also experienced a "great catch" about the crest of the right ilium when he bent his body forwards. He often complained of a sense of fatigue and a disinclination to sit erect even to his meals. He could not well sit on an ordinary chair, but preferred a high seat, as bending the body distressed him. When he got off his seat, he was obliged to walk on the toes of the right foot for a little time before he could rest the sole on the ground. Flexion of the toes of the left foot was very limited.

I got him to stand on the right leg and rest the weight of his body on that

limb alone. This he did without inconvenience, thus showing the great accommodation afforded to the head of the femur in the sciatic notch. Finally, he experienced difficulty in the flexion of this leg, and when sitting had to keep it fully extended.

Little comment is needed on this distressing case, left, I may say, altogether to nature. It is true many unpleasant symptoms were often complained of; but, on carefully reviewing the foregoing history of this case, and remembering that but twelve months had barely elapsed since those injuries were sustained, one of which had been again renewed, I think few practical surgeons will refuse to join me in stamping W. B.'s recovery as one of the greatest triumphs of nature in the conservative cure of injuries.

With one question I will conclude this case. Unless by manipulation alone under the use of chloroform could the dislocation of the fractured femur, when the injury was recent, be otherwise reduced?—*Dublin Med. Press*, March 4, 1863.

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30. *Aneurism of Vertebral Artery.*—The *Gazeta de Lisboa* relates a case of aneurism of the vertebral artery which was mistaken for aneurism of the carotid. It occurred in the Lisbon Hospital San José. The tumour occupied the eft side of the neck, reaching from the ear down to within four or five *centimètres* of the clavicle. It was soft, elastic, and pulsated feebly, the pulsation being diminished by pressure on the carotid. There was no *bruit* audible over t. It was first thought to be an abscess, and afterwards a carotid aneurism. The ligature of this artery was, therefore, practised; but the pulsations of the tumour were not stopped thereby. In the evening of the day of operation, the patient became agitated, and three days later paralysis of the left side of the face occurred, with violent pain in the arm, which was also paralyzed on the following day. The tumour was rapidly developed; dyspnœa, caused by pressure on the larynx, at last destroyed life about twenty days after the operation. The sac contained about 1000 *grammes* of blood, liquid and in clots, and communicated with the vertebral artery in its passage between the axis and the third vertebra.—*British Med. Journ.*, Feb. 21, 1863.

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31. *Mechanism of Dislocation of the Lower Jaw.*—M. Maisonneuve has succeeded in producing dislocation of the lower jaw on the dead body, by strongly depressing the chin, pushing the condyles forward by placing the fingers behind them, and suddenly raising the jaws by means of the index and middle fingers of each hand, placed behind and under the angle, so as to imitate the action of the masseters. This plan, he says, has never failed in more than thirty instances. On dissection, M. Maisonneuve has found that the condyles are carried in front of the transverse root of the zygomatic processes, and rest on their anterior face; that the coronoid processes, completely enveloped by the tendon of the temporal muscle, are depressed below the zygomatic arches, which they scarcely ever touch, and that they oppose no obstacle to bringing the jaws together; that the capsule of the joint is much stretched, but is not torn; that the external ligament, of which the normal direction is oblique from before backwards, becomes oblique from behind forwards, and is stretched, as are also the spheno-maxillary and stylo-maxillary ligaments; that the temporal muscle is elongated, but its tendon is not torn; and that the external pterygoid muscles and masseters are strongly stretched, but that the general direction of the action of their fibres is in front of the dislocated condyles, and not behind them. M. Maisonneuve found also that reduction was not facilitated by dividing the coronoid processes at their base, nor by dividing the zygomatic arches, nor by opening the capsule of the joint. On dividing merely the stylo-maxillary and spheno-maxillary ligaments, as well as the posterior fibres of the external ligament, the dislocation was reduced by the slightest pressure. He believes that the difficulty of reduction depends on the fixing of the condyle in front of the transverse root of the zygoma, by the passive resistance of the ligaments and the energetic contraction of the elevator muscle. He concludes hence that the best method of reduction is to gently depress the chin so as to relax the ligaments, and to push the condyles strongly back by means of the thumbs,

introduced into the mouth, and resting on the coronoid processes.—*Gaz. Méd. de Paris*, Nov. 8, 1862.

32. *Importance of Tapping Joints when distended with Fluid.*—Prof. INZANI, of Parma, in a paper on this subject, in *Omodei's Annali*, begins by asserting the perfect harmlessness of puncturing a distended joint, even during the progress of acute inflammation. The fear of bad consequences following from the wound of the tendinous structures is a mere imagination of the ancients; nor does the air ever appear to make its entrance. The puncture may be made with a trocar or a lancet; the latter is preferable for superficial joints. The author has operated very frequently on the knee, several times on the elbow, occasionally on the carpus and ankle, and once only on the hip; no bad consequences ever followed. Pressure by means of a starched bandage should be made, and when the synovial sac refills, it should be again punctured before the distension has advanced too far. In this way a radical cure may be obtained. Examples are given in which large joints, principally the knee, were open for effusions of blood, of serum in acute inflammation, of serum in chronic inflammation, and of pus—usually with a successful result. But paracentesis should be avoided where the skin is much thinned, and ulceration seems pending. In the synovial bursæ, paracentesis has given equally good results. The examples which are given are those of effusion in the sheaths of tendons after accident (as the peronei in sprains of the foot, the extensors of the thumb in falls of the hand), in which a puncture will give exit to synovial fluid mixed with blood, with much relief to the pain and abbreviation to the course of the disease. The author believes that by these punctures chronic synovitis may often be arrested in cases which, treated by ordinary methods, would end in "white swelling," and that in dropsy of the joint the treatment by repeated puncture and pressure is as effectual and more safe than by injections.—*Dublin Med. Press*, May, 27, 1863.

33. *Excision of the Knee-Joint.*—Mr. R. G. H. BUTCHER communicated to the Surgical Society of Ireland some interesting remarks on this operation, and related the case of a lad nineteen years of age, upon whom he had operated with success, making his fourth successful operation of this kind.

Mr. B. says: "It seems abundantly clear, from the facts collected by Dr. Hodges, as well as from the practice of Langenbeck, that gross carelessness and recklessness have been adopted in the selection of cases for the operation. What must we think of resection of the knee-joint performed for malignant disease of the patella, or what think of resection undertaken for acute abscess of the joint when pyæmia had already commenced? On resection performed on children, four years of age, who die of caries of the spine before the wound has had time to heal; notwithstanding, however great the authority or reputation of the surgeon that adopts such a line of practice, I deliberately state he is open to grave censure; he has mistaken altogether the nature and applicability of the operation, and has afforded examples of what ought to be avoided, and of a reckless style of operating, which tends greatly to retard the science, the art, and the progress of surgery.

"I never looked upon the operation of excision of the knee-joint but as a severe and terrible measure, not to be undertaken lightly or without grave consideration as to its applicability."

Mr. B. lays down the following directions to be adhered to in this operation:—

1. *The judicious selection of the case.*—The bones not being diseased far beyond their articular surfaces, while if upon section found to be a little more than had been expected, the part should be gouged out, or an additional thin slice removed; but if to a greater extent amputation should be at once resorted to, and as recorded in my first memoir with a hope of excellent success (*First Memoir on Excision of the Knee-Joint*, page 64). Again, the report goes on to show that amputation may be performed some days after excision should any unfortunate circumstance in the management of the case have arisen to demand

it. In this same paper seven instances are recorded of amputation of the thigh, and all made rapid recovery save one (page 65).

2. *The H incision should be preferred.*—The perpendicular strokes placed well back so as to allow all fluids and discharges to drain off; far more effective and safer than any opening made in the popliteal space. No portion of the flaps to be curtailed, though they may be thinned of any thickened fibrinous matter or diseased synovial membrane; the latter, particularly, should be clipped away with a strong scissors; all ligamentous fibres, both around and within the joint, should be cut through, and the extremities of the bones fairly freed and exposed.

3. *The patella should be taken away, in all cases, whether diseased or not,* and then the section of the bones well thrust out in front, should be made with "Butcher's saw," from behind forward, due attention being paid to the axis of the thigh bone at the time of its division.

4. *All bleeding vessels should be tied, or any that have sprung and retracted should be drawn out and secured,* so as to guard against intermediary hemorrhage.

5. *While the patient is yet on the operating table, the limb should be placed in the horizontal position, either by gentle and steady traction, combined with pressure of the cut surfaces of the bones backwards, or, if necessary, the division of the hamstring tendons.* Their support behind, in every case, I look upon as of great value; therefore, their section must be looked upon as a last expedient towards straightening the limb.

6. *During the adjustment of the bones, great caution should be exercised that their surfaces be throughout their extent in contact, and that no soft parts intervene.* The flaps should be then laid down and connected by suture closely throughout their transverse division, while the lateral incisions should be brought together only at their extremities by one or two points, and the central portion of each, that corresponding to the division of the bones, should not be brought in contact, but dressed lightly with lint soaked in oil, thus securing a ready outlet for the escape of fluids. The extremity should next be cautiously laid upon "Butcher's box splint," padded to the natural configuration of the limb, its sides elevated, foot-board applied, suitable pads introduced, and then the anterior splint laid on, taking the place of the assistant's hand, which from the first restrained the femur from projecting forward; then the straps buckled, the waist-band applied, and the patient may with safety be removed to his bed. The bed should be prepared in this way, and consist of a couple of hair matresses laid one upon the other, evenly supported, and intervening between the upper one and the sheet; a folded blanket, feather pillows for supporting the head and shoulders; the bed should be likewise moderately warmed so as to prevent the patient being chilled when put into it.

7. *The limb should not be disturbed for several days,* the length of time depending a good deal on the season of the year when the operation is performed, whether it be in the heat of summer or the cold of winter. After five or six days it may be necessary to let down the sides of the box-splint, to sap up discharge, change lateral pads, and soiled dressings, &c. By the apparatus named the facilities for cleansing the limb are so efficient that it may not be requisite to lift the member from its support for even so long a period as five weeks, as evidenced in my own practice. Should, however, it be considered expedient to change all the dressings, the anterior splint should be steadily held back by all assistants, and the limb pressed up to it, thus guarding against any starting of the femur forwards or displacement laterally when lifted from its bed. When the box is prepared freshly arranged, the limb, controlled after the manner mentioned, should be laid down, the side-splints elevated, foot-board secured, and the straps over the anterior splint first tightened, so as to maintain it in that position, from which it was never suffered to change. I would impress the advice still further, if the straps be unloosed for any purpose, *the hand of an assistant should steadily keep the anterior splint in its position* and well pressed back, until the artificial support is again brought to bear upon it and fastened.

8. *In cases where large abscesses form in the vicinity of the excised joint, or up along the thigh, Chassaignac's drainage tubes may be used with the best*

*hopes of success.* (See Butcher's Reports on Operative Surgery, *Dublin Quarterly Journal*, February, 1859.)

9. *The free administration of stimulants and sedatives, imperatively demanded in all cases of excision*, regulated to a certain extent by age, sex, temperament, and habit.—*Dublin Med. Press*, Feb. 11, 1863.

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34. *Malgaigne's Hooks for Fractured Patella.* By CAMPBELL DE MORGAN, Surgeon to Middlesex Hospital.—In a recent number of one of the Medical Journals, M. Malgaigne's hooks for the treatment of fractured patella are classed amongst the fracture apparatus which "may be regarded as models of what ought not to be used."

At the Middlesex Hospital, a large number of cases have been treated by the application of these hooks—perhaps, in no English hospital have they been more frequently used—and the results have been very satisfactory. My colleague, Mr. Henry, called attention to some cases under his care, in which a very close, and probably a bony, union had taken place under treatment by this apparatus.

The instrument consists of a pair of iron plates, each furnished at one end with two double sharp pointed hooks. One pair of these hooks is thrust through the skin, and is made to catch upon the upper edge of the bone: the other is similarly thrust in till it catches the lower edge. A screw bar then unites the two pieces; and by turning this the separated portions of bone can be readily brought into contact. When once fixed the hooks are allowed to remain until the parts have united; or until it may be thought desirable to replace them by a starched bandage.

Now, this sounds like a painful and somewhat savage proceeding, and one likely to be attended with danger; whether, in ordinary cases of fractured patella, and when cautiously applied, the hooks can give rise to mischievous consequences, I do not know. I have never seen the least indication of such results; and should not anticipate their occurrence. But as to the extremely small amount of pain which their application produces, and to its almost entire, and often entire, absence during the time they are worn, I can speak very positively; so far as the cases which I have seen or treated are concerned.

A case occurred not long since in the hospital, which illustrates this very satisfactorily. A woman slipped in coming down stairs, and fractured both patellæ. There was for three days a good deal of effusion into the joints. When this had subsided, I applied the hooks to the one side, leaving the other without any apparatus at all; both legs were raised in the usual position. Pain was, of course, produced, but only to a slight extent, while the hooks were being thrust through the skin. When I saw her the next day, she had not more pain on the one side than on the other; in fact, she had no pain on either side. The hooks remained on for more than a month without producing the least irritation or uneasiness. The broken portions of bone were pretty closely approximated on the side to which the hooks had been applied; on the opposite side, there was an average amount of separation—from half to three quarters of an inch.

Those who are conversant with the fact of the freedom from irritation which characterizes the presence of metallic sutures in the skin, would be prepared to expect a similar immunity from the presence of those hooks, if the parts be kept from motion.

I have a case now in the hospital which shows very markedly the simplicity of this plan of treatment, as well as the little tendency to irritation which it causes. A woman was brought in with a fractured patella. She was far advanced in pregnancy; and the house-surgeon judged very properly that she would be, in her condition, extremely discomforted if the limb were placed in the ordinary elevated position. He left her, therefore, till my visit. I found that there was only a moderate amount of swelling; and that the two fragments of bone were about an inch asunder. The hooks were at once applied, and the two pieces of the patella brought into contact. No splint or roller was used; nor was the limb elevated; she was simply enjoined to remain as quiet as she could. She has been lying perfectly comfortable, with no irritation around the hooks, and

no pain unless they be moved about. They have now been on for about a month; and the fracture seems to be nearly united.

There is one inconvenience which sometimes occurs, and which it requires a little management to overcome. The bones have a tendency to meet at an angle; so that while the two lower edges, for example, may be in contact with one another, the two upper edges may be separated by an eighth of an inch. I do not know whether practically there is any great harm in this; probably, the union is not so firm as it would be if the whole surfaces were in contact. The difficulty may generally be overcome by an alteration in the direction of the hooks, especially of the upper ones. They may be made to catch the bone in a different manner, without being altogether withdrawn; so that the pain of a second perforation of the skin is avoided. When once the proper position is obtained, and the screw adjusted, no further interference may be requisite until it is thought proper to remove the instrument.

So far from regarding these hooks as "models of what ought not to be used," my belief is that, if due caution be observed, there is no method of treatment which, with so little trouble to the surgeon, or irksomeness and pain to the patient, will produce such satisfactory results.—*British Medical Journal,* May 24, 1862.

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35. *Certain Errors in the Diagnosis and Treatment of Retention of Urine.*—Mr. Barnard Holt having lately met with several cases in which serious errors have been committed, both in the diagnosis and treatment of cases of retention of urine not *dependent upon stricture of the urethra*, has been induced to bring their salient points under notice of the profession. He relates five cases in which errors were committed, but as we suppose few surgeons of experience have not met with similar ones, we shall not transcribe them, but invite attention to some of his practical remarks, the importance of which we would like to impress upon our readers.

In all the cases related by Mr. Holt, the retention was due to paralysis of the bladder consequent on retention. "In fact," Mr. H. says, "the surgeons under whose care the cases first came were of that opinion, and attempted the introduction of catheters unsuccessfully, and then, putting the cases down as examples of 'suppression' were afterwards misled by the dribbling or overflow, which they took to be the re-secretion of the kidneys stimulated by the measures they had adopted.

"The diagnosis between retention and suppression is so very easy as to render a mistake perfectly inexcusable. In retention there is the urgent desire to micturate, accompanied with violent spasms, not only of the urethra and perineum, but of the whole abdominal wall; and as time elapses the *urgency increases,* the patient rolling in agony, and straining violently to relieve himself. Besides the surgeon's hand will at once detect the solid tumour above the pubes, formed by the distended bladder, which will yield a dull sound on percussion. In suppression of urine, on the contrary, there is no urgent desire to micturate, no spasm, and no agony consequent on a distended bladder; but the patient lies in a listless condition, soon passing into coma, whilst the breath and skin exhale a strong urinous smell. Moreover, the bladder will be found empty, and the fingers can be thrust into the pelvis, where the intestines yield a clear percussion sound. It must not be forgotten that a case of retention will at length pass into a typhoid condition, which might possibly be mistaken for the coma of uræmic poisoning; but the history of the case, and the presence of a distended bladder and dribbling of urine would at once point out its true nature.

"In all the cases I have seen, the error arises from the catheter's not having entered the bladder. Surgeons in general practice, who are not much in the habit of passing catheters usually introduce a gum-elastic catheter without a stilette, which, if it meets with even slight resistance, is very likely to bend upon itself, and thus never reach the bladder, although its whole length may have been introduced into the urethra. As I remarked in the early part of this paper, the injection of warm water at once clears up any doubt, and the fact that water cannot be injected may be considered conclusive evidence that the catheter has *not* reached the bladder.

"I have no hesitation in saying that in all cases such as I have described a catheter *can be passed* into the bladder, and I conceive it to be unjustifiable in any surgeon to be satisfied until he has withdrawn the urine; in which, if he will employ a metallic instrument of moderate size, he will in all probability succeed with ease. Time is of the greatest moment in these cases, and if, therefore, the surgeon in attendance do not succeed in his attempts, he is bound to call in assistance without delay, or his patient may possibly lose his life, or at least be condemned to the misery of the use of the catheter for the rest of his days.

"When the greater part of the urine has been withdrawn by the catheter, one of two courses must be pursued; either the instrument must be introduced every four or six hours or a gum-elastic catheter must be tied in, directions being given to the patient to empty the bladder at those intervals, with the view of keeping it nearly *empty*, so that the bladder may be able to recover its muscular tone and contractile power.

"The more I employ it, the more I feel satisfied with the use of turpentine, in ten or fifteen minim doses, in the cases complicated by hemorrhage from the bladder. In cases 3 and 4 it acted at once, although both gallic acid and the muriated tincture of iron had been employed without benefit; and I think the drug deserves a more general recognition by the profession."—*Lancet*, Feb. 21, 1863.

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36. *Incontinence of Urine.*—Mr. ROBERT JOHNS communicated to the Surgical Society of Ireland (April 10, 1863), the following cases of incontinence of urine, which are particularly interesting from the causes producing the affection, and from the novelty and success of the treatment:—

CASE 1.—Some years since a medical friend sought my assistance under the following circumstances: Mrs. B. sent for him, and stated that she should be obliged to get rid of her housemaid, whom she highly prized, unless he could cure her of an infirmity from which she had been suffering for upwards of a year, which was not only highly detrimental to her property, but most distressing to the girl herself. She was a strong, robust, healthy country girl, aged 25 years, of a plethoric habit, and was unable to retain her urine at night, which commenced to flow off involuntarily as soon as she became warm in bed, and continued to do so incessantly until she rose in the morning. My friend employed assiduously for two months every known treatment, but without the least benefit to his patient. He could not assign any cause for her malady, none of those laid down by writers having existed. However, on inquiring more particularly from herself, I discovered that about fourteen months previously she had had a bad fever, during which, on several occasions, her urine was retained, and on each was passed off by means of warm fomentations, but that the retention had eventuated in her then present complaint. I then recommended that a metallic catheter should be introduced each night into the bladder, and there retained for a quarter of an hour. At the expiration of a week from my visit, the doctor informed me that his patient was quite well, the catheterism having removed the incontinence, some benefit having resulted to her after the first introduction of the instrument.

CASE 2.—During the winter of 1861, Mrs. B., aged 30 years, of a strumous diathesis, called upon me, and stated that she could not retain her water for a minute, but that she was always worse at night, when she became warm in bed. She was the mother of one child (a male), which was still-born after a very tedious labour, requiring the use of destructive instruments for its completion. About the fourth day after the birth of her child her water began to pass off involuntarily, and had continued to do so for some years, but that about six months before her visit to me she had been cured of a very bad vesico-vaginal fistula (after six plastic operations) which had originated the incontinence. Having found on examination per vaginam and by the catheter, that the urethra and neck of the bladder were rough and highly irritable, every second day for three weeks I passed a metallic instrument into the bladder, and retained it there on each occasion for from ten to fifteen minutes, at the same time giving her each night a pill containing half a grain of extract of belladonna and four grains of

dried soda. Under this treatment her distressing complaint was removed, and at the termination of the period just stated she was able to retain her urine as well as ever she did at any time of her life.

Case 3.—On the 28th of December, 1862, I was brought some distance from town to see Miss M., a young lady, 13½ years old, who had only a few days returned from school, and had caught cold in travelling. I found the pulse quick, weak, and compressible; the tongue foul, covered with a whitish fur; the tonsils swollen, inflamed, and of a brick colour, with specks of diphtheritic exudation here and there on them, as well as on the soft palate. For a couple of days previously she had been complaining of chills and other feverish symptoms. At this visit she was also suffering very much from scalding and soreness of the genitals, consequent upon a dribbling away of her urine, which she had been unable to retain for a minute during the five preceding days. Her person and room were strongly impregnated with the urinous smell so common in such cases, and which obtained in the two former. Her throat was then well washed over with a strong solution of nitrate of silver, a gargle, consisting of dilute muriatic acid, chlorate of potash, honey of borax, and decoction of barley, was frequently used, the vapour of boiling water with vinegar was inhaled, and a mixture of infusion of bark, chlorate of potash, and tincture of the sesquichloride of iron was given every third hour, together with a liberal allowance of beef-tea and wine. For the soreness of the genitals fomentations of chamomile flowers with poppy-heads were employed, and followed by a lotion of subacetate of lead, at the same time strict attention to cleanliness being enjoined. Under this treatment the affection of the throat was removed, and the irritation at the vulva was lessened; but as the incontinence still persisted, the tonic mixture was continued, and cold bathing was ordered. On the 7th of January, as she exhibited some signs of incipient pertussis, from which her sisters and brothers were then suffering, she was ordered a stimulating imbrocation for the chest, and an expectorant mixture, with the addition of liquor potassæ and extract of belladonna, the former treatment having been suspended. After a few days she fancied the incontinence was somewhat less, yet, although the medicine was given more frequently, no real benefit accrued. On the 22d, as the pertussis was fully established, which increased very much the annoyance from the urinary complication, her mixture was changed for one consisting of tincture of cantharides, camphorated tincture of opium, syrup of bark, and syrup of orange-peel, but the liniment was repeated. On the 8th of February I was hurriedly summoned to see her, as she was suffering great pain in the genitals, which, on examination, I found to have been caused by an abscess in the right labia, which was at once opened with a lancet, and healed in a few days by linseed-meal poultices. Although the pertussis had been completely removed, yet, as the incontinence still obstinately remained, the bark and cantharides were given more frequently, and a blister was applied over the bladder, but without any better effect. On the 11th, having found that matters had not in any way improved, I passed a small-sized silver catheter into the bladder, and kept it there for ten minutes, when it, together with about an ounce of urine, was expelled with force into the bed-pan. On the following day she expressed herself as being much better; however, the catheter was again employed as before, and with the same happy results. On visiting her on the next day, she said she was quite well, and could retain her water for any length of time, and as well as she did at any period of her life, which salutary condition has continued up to the present. In the following way, according to her own statement, this distressing complaint originated: Having been at school about 100 miles from Dublin, she left for home for the Christmas vacation very early in the morning of the 23d of December, and did not arrive at her father's house until very late that evening, not having passed water during the entire day, although on several occasions having had a desire to do so; but as she was unaccompanied by a female friend, she was ignorant how to act, and after some time all the inclination to micturate passed off. On her arrival in Dublin she essayed to empty the bladder, but without success; yet, after several trials, she effected her object at the end of two hours. On the following day on rising she first became sensible of the incontinence, which had

been continuing during the night, and which persisted, as already stated, up to the 12th of February.

The points of interest in those cases to which I would direct attention are, the causes of the complaint, its persistent resistance to all medical treatment, and yet its having eventually yielded to so simple a surgical means.—*Dublin Med. Press*, April 29, 1863.

37. *Successful Treatment of Severe Stricture of the Urethra by Gradual Distension at a Single Sitting.*—Mr. HENRY THOMPSON read a paper on this subject, and as there exists much diversity of sentiment in regard to the best mode of treating this affection, we give an abstract of the paper with a report of the discussion to which it gave rise, inasmuch as they present us with the views of the prominent London surgeons on this mooted question.

Mr. Thompson's object was to illustrate and explain a new method of treating severe or obstinate strictures of the urethra. This term is intended to denote those which are a little benefited by dilatation. The distinction which constitutes its novelty does not consist in the mere production of some alteration or improvement in existing mechanical contrivances, but in the adoption of a mode of action on the stricture itself, which is different from those which characterize any of the other systems of treatment pursued at the present day. The author shows in what it differs from dilatation, simple and continuous; from rupture, or "instantaneous treatment;" from cauterization; and from incisions. He illustrates the proceeding, which he distinguishes by the term "gradual distension," and describes the instrument employed to accomplish it. By the process in question, the strictured part of the urethra only is acted upon, and this not to a degree short of, but up to or even beyond the natural calibre of the canal, wherever the stricture may be situated. All this is accomplished at one sitting, but with gentleness and slowness, so as to avoid unnecessary rupture; the degree of distension being regulated with absolute certainty, and its extent indicated with extreme accuracy, by apparatus in the handle of the instrument employed. The object of the operator is not to rupture, but to overdistend the fibrous tissue which constitutes the stricture, so as to destroy, or at all events, to impair, its natural tendency to contract. He aims at attaining that result which occurs from the practice of over-distending vital tissues elsewhere,—viz., to impair or destroy their contractility. This is known to happen after the application of over-distension to both healthy and morbid tissues, and is turned to account by the surgeon for that purpose. The class of patients for which this proceeding appears to be best adapted is described, and illustrative cases are appended. The instrument consists of two long and narrow steel rods, accurately applied throughout their entire length by the single plane surface which each possesses. The external surface of each rod is convex, so that together they form a nearly cylindrical instrument, but tapering towards the lower extremity, where they are closely united. At the opposite or upper end they are also united, and are surmounted by a handle resembling that of an ordinary sound. This handle is attached to a screw with a very fine thread, which being turned causes the two rods to diverge very slowly and very gradually from each other at a given spot, about six inches from the handle. When the separation of the blades is effected, an index placed near the upper end, and connected with some numerals on a disk, shows the exact degree of extension made by pointing out that number of the catheter scale to which the distension existing at that moment is equivalent. The general form and contour of the instrument is that of a slightly curved catheter. When the screw handle is turned, the two rods separate, so as to form a long oval or spindle-shaped figure, the long diameter being about three inches and a half or four inches in length, and the short diameter corresponding to the number of turns given to the screw and varying between the slightest possible separation of the rods and an interval of about three-eighths of an inch, or even more. The stem of the instrument has marked on it a graduation in inches, which commences one-quarter of an inch below the point of maximum distension or centre of the spindle-shaped figure produced by the separated rods. It is that point which will correspond with the stricture when the instrument is placed in the urethra, so that the con-

tracted portion of the canal undergoes the greatest amount of distension which it can be desired to produce, while the rest remains wholly unaffected. The mode of applying the instrument is as follows: A medium or full sized bougie or catheter is first passed as far as to the stricture, and the distance from it in inches to the external meatus carefully noted. Suppose it to be five inches, the operator, taking the distending instrument, places the little blue steel collar which slides on its shaft opposite to the figure 5, and passes the instrument through the stricture until the collar arrives at the meatus of the urethra, and prevents the instrument from entering further. The maximum point of distending power must therefore correspond with the narrowest part of the stricture. The act of distension is now commenced by making two or three turns of the screw-handle, and is continued by slowly turning it once every half minute, taking care at the same time to prevent the instrument from shifting its position, by observing that the collar remains opposite the external meatus. In a short time the index, gradually rising, shows that the calibre is reaching Nos. 10, 11, 12, and so on, until in a few minutes No. 14 or 16 has been reached, which latter limit is usually quite sufficient. The screw-handle is now slowly turned backwards, not the whole way, but until the index has retreated to about No. 8 or 9 when the instrument is withdrawn. The operator next passes a full-sized gum-catheter into the bladder, and fastens it there, leaving it in place for about twenty-four hours. It is then removed altogether. All that remains to be done is to pass a full-sized metallic instrument every second day for a week, and after that at increasing intervals for a week or two longer.

Mr. Holt said that his mode of operating having been alluded to by Mr. Thompson, he was desirous of offering a few remarks upon the plan which that gentleman had proposed to the society, as contrasted with that which he (Mr. Holt) had adopted for some years. Mr. Thompson's instrument differed materially from his, both in the method of its application and its capability of enlarging the strictured portion of the urethra, and he claimed for his instrument the power of dilating the stricture to No. 14 or 16, while the meatus is not interfered with. For its application, however, it was necessary a gum-elastic catheter should be retained in the urethra for two or three days. It was then removed, and the seat of the stricture accurately ascertained by passing a large bougie. This is to be marked, and such measurement is to regulate the distance which his dilator should be introduced. The patient being now placed under the influence of chloroform, the dilator was passed, and the handle slowly and gradually turned, so that dilatation could be effected to any extent, the whole operation occupying from ten to twenty minutes, according to the character of the obstruction. The dilator was now removed, and a No. 12 gum-elastic catheter substituted, and retained in the bladder for two or three days, according to circumstances. A No. 12 bougie was afterwards passed at intervals of a day, and so the after-treatment was continued as in any other plan. Now, his (Mr. Holt's) first objection to this method of treatment applied to a difficulty which might arise in the hands of a surgeon less accustomed to the passing of bougies than the author of the paper. The penis during an examination alternates in its length, and is at one moment quiescent and at another semi-erect. When this occurred, it would so alter the relative measurements as to render them of little value; and this part of the treatment was of great practical importance, inasmuch as it was necessary that the centre of the dilating power should exactly correspond to the centre of the stricture, and without it the dilatation would be either in front or behind the obstruction, and so be perfectly ineffective. His next objection would apply to instances in which there was more than one obstruction; for in his experience there were frequently two, and sometimes three or even four obstacles to be overcome, and in these instances it would be necessary to materially prolong the operation, or repeat it upon three or four separate occasions. Mr. Thompson laid particular stress upon his capability of dilating the stricture to No. 14 or 16 or more, when the meatus will only admit a No. 12. In the first place, he (Mr. Holt) believed the author was in error in supposing that a dense obstruction would allow itself to be dilated to the size he mentioned; it must be ruptured, as was shown by the occurrence of hemorrhage. But even granting that it was so, he (Mr. Holt) could not see the least advantage

that could arise from dilating a stricture beyond that which could be maintained by the after-passage of a bougie. The part which was so dilated quickly contracted, otherwise there would not be any necessity for the after-passing of the bougie; but as this was necessary, and the bougie could only represent the size of the meatus, no advantage could accrue from distending the stricture beyond its natural limit. If any further proof were required that this was so, he might refer to the median operation of lithotomy, which he had frequently performed, and removed, without cutting the neck of the bladder and prostatic portion of the urethra, calculi varying from an inch to an inch and a quarter, the parts being dilated by the introduction of the finger, the subsequent passage of the forceps, and the extraction of the stone. In all these cases the patient had retained the power of expelling the urine at will, which specially showed how speedily any undue dilatation of the urethra contracts again. His (Mr. Holt's) third objection would apply to the necessity of retaining a catheter in the bladder both before and after the operation had been performed. In many instances the patients were quite incapable of bearing the retention of a catheter, from the pain and irritative fever it produced, and it confined them to the house or bed for an unnecessary period of time. Mr. Holt then related a remarkable case of irritable and intractable stricture, in which, after all the usual means employed for a long period had failed in the hands of an experienced surgeon, he had, in a few minutes, split up the stricture with his instrument, and the patient recovered without a bad symptom, and remained well to this time—a period of twelve months. Were he not afraid of occupying too much of the society's time, he could relate several most interesting cases to prove that he had not made any selection for the purpose of enhancing the success of his operation; but that, on the contrary, he had operated upon the most severe and complicated examples that could be submitted to the surgeon. Two other cases he would briefly allude to. One was that of a gentleman from Liverpool, who consulted him for incontinence of urine, from which he had been suffering for two years, during which he was compelled to wear a urinal, and his health was so damaged that he was recommended to go to Madeira for a change. Upon inquiry, Mr. Holt was satisfied that the bladder was full, and, having gained the patient's consent to introduce a catheter, he, with great difficulty, passed a half No. 1, and removed three pints of most offensive purulent urine. His bladder was paralyzed, and there was every probability, from the length of time it had been distended, that the ureters and the pelves of his kidneys were abnormally enlarged. For the purpose of keeping the bladder empty, the catheter was introduced three times during each of the first two days, and upon the third he passed the dilator and split the strictures, so that the urethra would admit a No. 10 catheter. In one month this gentleman returned to Liverpool, with his health almost entirely re-established, passing urine with the greatest facility, and the urethra admitting a No. 10 easily. During the last month, Mr. Cutler asked his (Mr. Holt's) opinion upon the case of a gentleman who had been operated upon by Mr. Syme. The patient had subsequently been subjected to internal division, and a second time Mr. Syme's operation was performed by Mr. Bickersteth, of Liverpool. When he consulted Mr. Cutler, he was obliged to pass the catheter five or six times in the twenty-four hours, and he was entirely prevented, by the escape of urine during the intermediate periods, from entering into society. Mr. Holt, having explained to him that in such a case he could not positively affirm what the result might be, consented to split the obstructions; but the patient, being exceedingly nervous from the recurrence of rigors after every attempt to enlarge the urethra, would not consent to the operation without the aid of chloroform. The dilator having been passed, it required all the force Mr. Holt could make use of, even with a towel placed over the large extremity of the tube, before the stricture could be split. Upon the dilator being removed, a No. 10 catheter was passed, and the bladder emptied. This gentleman never had a bad symptom of any kind or description; he never even went to bed, and in two days was able to visit some friends in the country. He declared that he could now pass urine better than he ever remembered; and in a fortnight he returned to Jersey, being capable of introducing an instrument himself without the least difficulty or pain. Mr. Holt

stated that he had now operated, in hospital and private practice, upon more than 250 cases, without any complication of either infiltration of urine, abscess, swelled testes, or inconvenience of any kind, further than the occasional supervention of a rigor or mild attack of stricture fever. He must therefore still retain his opinion in favour of his instrument, which had now been tested to the utmost. It was perfectly simple, and capable of being used by any surgeon who was able to pass a catheter. The operation did not require either the previous or after retention of a catheter in the bladder; it was completed in one second, however many obstructions there might be; it did not, excepting in very severe cases, require the administration of chloroform, and the patients were not confined to the house longer than the afternoon in which the operation was performed; the pain was of the most trifling description, and the danger *nil*. He would only detain the society another minute in describing the improvement he had lately made in the dilator, and which had been only completed that day. The objections raised to it by some surgeons were, that in its present state you had no positive evidence when you were in the bladder, and that the tube might possibly slip from between the blades. He had now so improved upon this that it was quite impossible the tube could so escape, and the dilator acting as a catheter permitted the flow of urine. He had no hesitation in declaring that, as now manufactured by Messrs. Whicker and Blaise, of St. James's Street, the dilator was as perfect as any instrument could possibly be.

Mr. Solly was pleased at any proceeding which showed the advantage of dilatation over cutting in the treatment of stricture. He contended that if an instrument could once be passed into the bladder, cutting was unnecessary. There might be cases in which it would be impossible to succeed in such an effort, and then incision might become requisite. He had never had recourse to the plans recommended by Mr. Thompson and Mr. Holt, but had been in the habit of adopting a modification of Mr. Wakley's plan, previously resorted to by Hutton, of Dublin. He used a catgut bougie instead of the metallic guide, and elastic catheters instead of the silver ones. He had used this plan of gradually dilating the urethra with much success. In hospital patients he allowed the catheter to remain in the bladder for some time, but not more than half an hour in private practice.

Mr. Fergusson said it had been proved that dilatation of the urethra might be effected, even to the extent of a No. 12, 14, or 16 catheter in a few minutes, without risk, and effectually. The mode now adopted for this purpose differed entirely from what was called "forcing down a stricture" by the introduction of a full sized catheter. This was not unattended with danger; for it was not always possible to tell where the point of the instrument would go, or to what extent the urethra might be damaged. By the mode employed by either Mr. Thompson or Mr. Holt, no such risk was incurred. He (Mr. Fergusson) thought the plan mentioned by Mr. Solly would not be found so effective as when the silver instruments were used. With regard to Mr. Thompson's instrument exhibited that evening, he questioned if it were strong enough to break up the stricture without breaking the instrument in some of the more severe cases. This could not occur when Mr. Holt's plan was resorted to; however great the force applied, the instrument could not give way. So much force was occasionally required, that he (Mr. Fergusson) should be fearful of trusting to Mr. Thompson's instrument. This instrument, as far as the plan of treatment itself was concerned, did not differ much from that of Mr. Holt. The plan of immediate dilatation would do much towards dispensing with internal and external urethrotomy.

Mr. Acton was glad to hear that the advocates of the various plans for treating severe forms of stricture had not found cause for disparaging that by internal incision, a treatment he had found most successful. It was admitted on all hands that dilatation, consistently persevered in, was alone sufficient to remedy the greater portion of strictures. In hospital practice (in order to save the time of the poor) it might be necessary to resort at once to other plans; but, among the upper classes, where a rapid cure was not of such importance, the patient usually objected to have his stricture split, or any other similar heroic remedy employed, and which he (Mr. Acton) was glad to hear was unattended with any

danger. The Fellows of the Society must, however, recollect—and the shelves of the surrounding library would support the statement—that the advocates of every novel treatment of stricture had ever lavished the same praises on their different systems as had been listened to that evening. Time could alone test the value of the rival schemes; but he was not inclined to think that any one system would be found applicable to all cases. It had been stated in the course of the discussion, that within a short period, and in the practice of one surgeon, 250 cases of stricture had been split. Now, seeing the comparative rarity of cases requiring such treatment, we must believe that many strictures had been split which would have been treated (by other surgeons) by more simple means. The author of the paper had spoken of the success of his treatment depending "upon over-distension of the fibrous tissne, so as to destroy, or at all events impair, its natural tendency to contract." He (Mr. Acton) was yet to be convinced that over-distension at one sitting would accomplish this very desirable end; for the more he treated stricture, and the more he studied the structure which composed the India-rubber-like mass we had to distend, the less disposed was he to believe in a rapid cure, or that a healthy structure would at once displace this elastic tissue. Stress had been laid during the discussion by more than one speaker on the advantages of his or their operation as succeeding after others had been tried and failed. Mr. Acton would appeal to the practical Fellows of the Society if cases were not brought under their notice of patients who had been condemned to these heroic operations, and who before submitting to them applied for a second opinion, and who were cured by dilatation alone, showing that the operation that had been recommended was at least unnecessary. When dilatation was unable to effect a cure, internal incision came in most opportunely, and the division of the elastic tissue by the knife enabled the surgeon to pass his instrument, and cure the stricture. This, he maintained, was the more scientific treatment, and more in accordance with all the theoretical and practical principles of surgery, and one which had been gradually gaining ground since the instruments employed had been perfected.

Mr. HULKE had employed Mr. Holt's plan in thirty cases, many of which were out-patients at the hospital. He had never seen any untoward result, though the patients went about as usual. He did not regard it as a serious operation.

The PRESIDENT had in many cases followed Mr. Holt's plan of proceeding. He had never seen any but good results from it.

Mr. THOMPSON replied *seriatim* to objections raised by Mr. Holt. First, that there was no difficulty in measuring the distance at which a stricture was situated from the meatus in order to adjust his instrument, and that no man who found that a difficulty was competent to use an instrument in the urethra at all. It was, indeed, an ill compliment to surgeons to imagine want of ability to accomplish so easy a matter. Secondly, that it was not often necessary to apply the instrument for two strictures in the same urethra, but if there were two, no difficulty in applying it twice existed. Thirdly, that although it had been his practice to tie in a gum catheter twenty-four hours afterwards, he did not regard it as necessary; he had done so as a precaution, and if any objection to this existed, it would be as safe to dispense with it here as after Mr. Holt's operation. From the remark, that there was no advantage in distending to No. 16, if the bougies subsequently passed could not exceed No. 12, he differed very widely. It had long been admitted to be a desideratum to find some means of dilating the stricture to the size of the canal where it is situated, and it is notorious that the bulbous portion, where stricture most commonly exists, is little more than half dilated by a bougie which fills the external meatus. The subsequent dilatation by such a bougie sufficed, but if thought necessary it might be maintained by the distending instrument itself which formed an excellent dilator. He had a patient at this moment who preferred it to a bougie for ordinary use. Again, it had been assumed on theoretical grounds that its power was deficient. He could only say that in practice the instrument had resisted very severe tests, and was amply strong enough for its purpose; but he would say again, as he had said in the paper, that where the induration surrounding the urethra was very considerable, involving, possibly, the substance of the corpus spongiosum throughout, especially when anterior to the scrotum, incision was more likely to

be permanent in its effects than either his own or Mr. Holt's method. He agreed with Mr. Acton that this was highly useful in some cases. An important distinction existed between forcible catheterism and distension, which had been well drawn by Mr. Fergusson; the dangers of that now happily exploded method resulted from tearing away the stricture from its connections, and driving it down the urethra. Simple expansion from within outwards, provided it was thoroughly efficient, had now been proved to be unattended with danger. Finally, it was most satisfactory to him to hear from Mr. Holt and others the success which had attended his operation, because in some particulars it was closely allied to his own proceeding; thus, he contended that Mr. Holt's operation might be perfectly performed with his (Mr. Thompson's) instrument, but that the latter possessed in addition these two advantages—first, power to carry the distension to a much higher point; and, secondly, that it could be done gradually and slowly, so as to over-distend the tissues as much, and rupture them as little as possible. It was on these two grounds of difference that he claimed for this proceeding an examination and a trial, since he conceived them to constitute an improvement of no mean value.—*Med. Times and Gaz.*, May 2, 1863.

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38. *Observations on Ovariotomy, etc., Statistical and Practical; also, a Successful Case of Extirpation of both Uterus and Ovaries.*—Dr. Clay gave to the Obstetrical Society of London (March 4, 1863) a brief and interesting outline of his experience on this very important branch of surgery. Of 109 peritoneal sections, of which 104 were for ovarian extirpation, 3 for cutting down upon the tumour to establish ulceration where its removal was known to be impracticable, 1 for the Cæsarean operation, and one for the removal of both uterus and ovaries. Of the 104 ovarian cases, 72 recovered, 32 died; all the 3 ulcerative cases recovered; the Cæsarean section lived to the fifteenth day; and, lastly, the case of entire removal of both uterus and ovaries recovered. Of the 32 deaths, 10 died from the immediate consequences of the operation, 10 from inflammation, 10 from prostration, and 2 from hemorrhage. The great majority of the first and second series were young females, as well as a portion of the third division. Those from prostration were chiefly elderly females. Some other statistical facts were elicited, as well as the following remarks from the author: Dr. Clay still defends the raised temperature of the room for operation, and attributes much of his success to its influence; is not certain if chloroform has added anything to the successful results, although he values it highly as an agent which it would now be difficult to lay aside, although the first fourteen of his cases were performed before it was discovered, and of which nine recovered; and he still thinks, if a woman could face the difficulty without it, it would be in her favour. The large incision is still practised by him, and deemed far preferable to the smaller opening. Of course, the author wished to be understood that the incision was to be commensurate with the tumour to be extirpated. Dr. Clay gave many reasons for this preference. The distressing vomiting he conceived to be in a great measure owing to the use of chloroform, as he saw but little of it in the first fourteen cases where it was not used. For this troublesome symptom he advises patience until the blood has got rid of its load of carbon, the simplest of drinks, and as little food as possible. Some very well-ascertained facts of critical days were adduced, which would require too much space to dwell upon; suffice it to say, the third, sixth, and ninth were the principal, and the causes of each were pointed out. No particular age seems to be prominent in respect to the success of these cases. Dr. Clay himself stated them to be about equally successful at all ages from sixteen to fifty-seven. Purgatives are not admissible; and he relies on enemas, with ox-gall, etc. This part of the paper was concluded by some interesting remarks on ovariotomy for the last twenty years, and the difficulties the author had to encounter, not the least of which was misrepresentation. The author next gave in detail a new and interesting operation, which he believed to be the first of its kind, successful at least, in this country—namely, the entire extirpation of the uterus and its ovaries through the abdominal walls, which has ended most fortunately, the lady returning to her friends on the thirty-fifth day after the operation, and still continuing well, thus establishing another great fact in reference to abdo-

minal surgery. The case was that of a fibroid uterus of eleven pounds weight, with the ovaries in an unhealthy condition; and the tumour by its growth had latterly so entirely filled up the cavity of the pelvis as to render the passage of the feces and urine extremely difficult. The particulars of the case throughout its progress were given. Dr. Clay does not suppose that many uterine cases could be advisedly extirpated, but thinks some of those densely-hard fibroid masses, where the constitution has not been greatly prostrated, might afford a fair prospect of cure under the knife.

Mr. SPENCER WELLS said that he must not be supposed to undervalue the very useful paper of Dr. Clay, or to be ungrateful for the lessons which he had taught us all by his able advocacy of ovariotomy, if he (Mr. Wells) ventured to discuss two very important steps of the operation in which his own practice, and the practice in London generally, differed from that of Dr. Clay. Dr. Clay still advocated the long incision; and he still left the tied end of the peduncle and the ligature within the peritoneal cavity. He could boast of a success attending this practice of 70 per cent. of recoveries to operations, and as success was the best criterion in surgery, it might seem presumptuous to question the wisdom of any operative proceeding practised so successfully. But his (Mr. Wells') own experience had led him so decidedly to prefer the short to the long incision, and to keep the tied end of the pedicle outside rather than to leave it in, that he could not help suspecting that Dr. Clay's great experience in the operation had led him to success in spite of a method which more recent experience had modified or corrected, and which men of less experience could not follow without great danger of failure. After long incisions there was so much more exposure or escape of intestine during the operation, so many more serious symptoms after it, and so comparatively protracted a recovery, even in successful cases, that his (Mr. Wells') own experience had taught him to avoid any greater length of incision than was necessary for the exposure and removal of the cyst or tumour. Every inch in the length of incision appeared to add something to the chances against the patient, and in cases where he had the choice either of making a long incision and removing a tumour entire, or of breaking up a tumour and removing it through a small opening—even though ovarian fluid might unavoidably escape into the peritoneal cavity and require careful sponging for its removal—he would prefer this alternative rather than make a very long incision. So, in his experience, those patients in whom it had been necessary to leave the pedicle and ligature within the peritoneal cavity had suffered so much more after the operation, and their recovery had been so much more protracted than others where the peduncle had been kept outside, that he would always prefer to keep it out if he could, and so avoid the danger of absorption of the putrid matter of the strangulated stump, or the peritonitis connected with the effusion of fibrin thrown out to circumscribe the stump and ligature. It seemed probable that the frequent occurrence of peritonitis in Dr. Clay's practice was in some measure due to his manner of treating the pedicle; for in his (Mr. Wells') own practice, peritonitis was a rare accident. Of eighteen fatal cases, it had only had any important share in the fatal result in two; in all the others, shock or exhaustion after the operation, or blood-poisoning, having been the cause of death; while in successful cases he hardly remembered peritonitis in any patient where the pedicle had been kept out. As to the temperature of the room, in his earlier cases he had followed Dr. Clay's practice; but latterly he had found it better simply to have the room kept comfortably—not excessively—warm, and after the patient was in bed to keep a good fire burning and a window open night and day. In the use of opium also he had learnt to avoid all excess. If there was pain or restlessness, it was given in moderate doses, and repeated if necessary; but some patients had recovered without taking a single dose, and others with not more than two or three doses. Sometimes it was given to secure a good night, even if there was no pain. With regard to the removal of uterine tumour by abdominal incision, it was only under the most exceptional circumstances—where the life of the patient was in great danger from hemorrhage or the effects of pressure—that such an operation as that so successfully performed by Dr. Clay could be justifiable. Pedunculated peritoneal outgrowths from the uterus might be removed

with moderate risk, and so might ingrowths towards the uterine cavity or vagina; but any attempt to enucleate interstitial fibrous tumours of the uterus, either by incision through the abdominal wall, or by incising the cervix *per vaginam*, was attended by such very great risk that nothing but the most urgent necessity would justify the practice. He (Mr. Wells) said this rather as the result of his own observation, than as any conclusion suggested by Dr. Clay's successful case.—*Med. Times and Gaz.*, April 18th, 1863.

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39. *Vesico-vaginal Fistula.*—Dr. I. Baker Brown read (Feb. 4, 1863), before the Obstetrical Society of London, an interesting paper on vesico-vaginal fistula, the mode of operating, and the results obtained in fifty-five cases at the London Surgical Home. In the first part of the paper the author gave an account of the method at present followed by him in operating. The various steps of the same were illustrated by drawings. No bars or clamps are used. The knives employed are two—one for the right hand, and one for the left. The needles, of various curves, forming a series fourteen in number, are on the same principle as Startin's, but of rigid material. They are armed with wire, and thrust through the pared edges, great care being taken to avoid the mucous coat of the bladder. The two ends of the wire are simply twisted round and round, and so fastened. The patient is afterwards laid on the side, and a male elastic catheter, with bag attached, kept in the bladder. She is kept quiet ten or fourteen days, and the wires removed. The operation is often completed in ten minutes. The total number of cases of vesico-vaginal fistula admitted into the London Surgical Home since its foundation, four years and a half ago, is 58. Of that number, 55 were submitted to operation, with the results as shown in an accompanying table. The remaining 3 were not operated upon in consequence of the bad condition of bodily health, the result of syphilis. Of the 55 cases treated, 53 were operated upon by the author, 1 by Mr. Nunn, and 1 by Mr. Harper. Of the total number of operations, 43 were followed by perfect cure, 1 was much relieved, 2 died, 5 were not cured, and 4 are still under treatment, with every prospect of cure. Of the 43 cures, in 24 this result followed the first operation, including the cases of Mr. Nunn and Mr. Harper; in 8 the cure occurred after the second operation; in 5 after three operations; and in 6 after more than three operations. Of the other cases which were not cures details were given in tables exhibited. Of the two fatal cases, 1 died eighteen days after the operation, apparently from exhaustion, the age of the patient being 56; the other died seven days after from pyæmia. With regard to the causes of vesico-vaginal fistula. Of the 58 cases admitted into the London Surgical Home, 47 were over twenty-four hours in labour, and 39 were as much as thirty-six hours or more; 7 were two days, 16 were three days, 3 were four days, 2 were five days, 2 six days, and 1 seven days. In the whole number of cases, instruments were used in 29, exactly one-half; and in 4 only of these was the labour less than twenty-four hours, and with 7 exceptions the patients had been thirty-six hours, or more in labour before instruments were used. Of the 58 cases, in 24 only the injury happened at the first labour, in 7 at the second, in 5 at the third, in 4 at the fourth, in 6 at the fifth, in 2 at the sixth, in 5 at the eighth, in 1 at the ninth, in 1 at the thirteenth, in 1 at the fifteenth, and 2 not mentioned. In many of these cases, notwithstanding the existence of the fistula, the patient bore several children, apparently without inconvenience, before coming under treatment; and in a few of them, subsequent to cure by operation, other children have been born without recurrence of mischief. In a large proportion of the cases there is a history of the birth of a very large child; in some it weighed 15 lbs.; and in one, that of the woman in whom the lesion happened at the fifteenth labour, the child weighed 17 lbs. From the foregoing statistics it is evident that the cause of the lesion is protracted labour, and not the use of instruments or deformity of the pelvis; and, as a necessary conclusion to what has been stated, it follows that vesico-vaginal fistula would scarcely or never occur if a labour were not allowed to become protracted: that is a point for the careful consideration of the society and of practitioners at large. A printed tabulated statement as to the 55 cases operated on was handed round. Mr. Brown further stated that he had had 11 other cases under his care at St. Mary's Hos-

pital, and 6 in private practice, making a total in his own experience of 58 cured; 34 by one operation, 11 by two operations, 5 by three, and 8 by more.

Mr. Brown said in America, Drs. Sims and Bozeman did nearly all the denuding of the edges with scissors. This made the operation very long. But if the knife were first used to mark around the fistula how much was to be taken off, and then, by means of a fine pair of forceps, the edges were made tense, Mr. Brown said that the whole fistula might be denuded, taking out a complete ring—a matter of great importance. In regard to the sutures, Mr. Brown stated that he greatly preferred wire, although Dr. Hayward, of Boston, United States, used silk in preference. Mr. Brown had by this gentleman's advice used silk in one case with a good result. But they were more liable to slough, and the wires, from their stiffness, had the advantage of keeping the edges more in apposition, and so insuring a greater depth of union. But the sutures to be used should, Mr. Brown thought, be silver, not iron, as recommended by Dr. Simpson, of Edinburgh. Mr. Brown expressed a very strong opinion in favour of keeping the sutures in long enough; never less than nine days. He believed no harm ever resulted from retaining them in longer; but in one case he had had, he removed them on the sixth day, at the patient's request. The fistula appeared quite healed. She got up next day, contrary to advice, and the whole burst open again. She was reoperated on; the sutures were left in a sufficient time, and a cure resulted. Mr. Brown had made experiments, and kept silver sutures in for six and nine months, and no trace of ulceration appeared. Mr. Brown considered that opium should be given only in sufficient quantities to keep the bowels quiet. One grain immediately after the operation, and repeated night and morning, according to the circumstances of the case. Many patients cannot bear the catheter, especially the leaden one, but Mr. Brown had seldom found the male elastic catheter to cause irritation. Perhaps in time we might gain sufficient confidence in the operation to allow the patient to pass her urine as required, but at present it was better to retain a catheter, or, when that was not tolerated, to pass one when needful. He had purposely used the term protracted without reference to the cause of protraction, for it was very rarely that a medical statement could be obtained. It was necessary therefore to take only the statement of the patient as to the duration of labour. When the head was impacted, Mr. Brown would deliver as soon as possible by forceps. He quite agreed with Dr. Tyler Smith as to the necessity of maintaining the integrity of the other parts in these operations. Of the two cases on which he (Mr. Brown) had operated, and where the patients subsequently menstruated per urethram, in one, the patient having been under many operations in other hands for some years, the os had already been interferred with either by sloughing or by the operation, and only one small opening, as described, remained to be closed. There was therefore nothing left to do but to close the opening, regardless of the menstrual flow. The patient had done well. No inconvenience had arisen, and she was grateful for the benefit received. In the other, that lately brought before the society by Mr. Chapman, the os uteri was already closed by cicatrization, after extensive sloughing, and therefore Mr. Brown had nothing to do with its occlusion. He considered that the two terms, vesico-vaginal and vesico-uterine fistula, were not used with sufficient caution. Although the os uteri might often be involved in vesico-vaginal fistula, the true vesico-uterine fistula was when the hole was high up in the cervix, urine dribbling through the os uteri, although no aperture from the bladder was visible. This was the kind of which Jobert had related seven cases, Dr. Fleetwood Churchill one, and which had lately been so well described by Mr. James Lane, who had had one case. In all these the treatment had been to close the os, so that the patient menstruated per urethram. He (Mr. Brown) had never had such a case, but he thought that the treatment adopted was decidedly the lesser evil, and if the patient, on having the case laid before her, was of the same opinion, he considered it perfectly justifiable. The case Mr. Nunn had mentioned showed that, by leaving a vesico-vaginal fistula alone, other evil results, besides the inconvenience, would arise.—*Med. Times and Gaz.*, April 4, 1863.

## OPHTHALMOLOGY.

40. *Cerebro-Spinal Origin and Diagnosis of the Protrusion of the Eyeballs termed Anæmic.*—The *Edinburgh Medical and Surgical Journal* for February last contains an extremely interesting paper by Prof. LAYCOCK on a disease characterized by general debility resembling anæmia, considerable and varied nervous disorder, greatly increased activity of the heart and of the arteries of the head and neck, a vascular enlargement of the thyroid gland resembling bronchocele, and staring eyes, with protrusion of the eyeballs, giving a peculiar expression to the face. This affection has, within a few years, attracted much attention, and its pathology has given rise to much discussion, though the opinion put forth by Dr. Begbie, of Edinburgh, that it was caused by anæmia has been most generally accepted.

Prof. Laycock combats this opinion, and maintains with great plausibility that the affection results from disorder of the nervous system. He shows that the symptoms and signs which are relied upon as diagnostic of anæmia are of questionable value, and that they may all be the result of disorder of the nervous system.

The views of Prof. L. are founded on the brilliant physiological researches into the functions of the nervous system, conducted by Stilling, Claude Bernard, Schiff, Budge and Waller, Brown-Séquard, and others, and they seem to us of so much practical value that we shall give a full exposition of them.

"A very distinguished anatomist and physiologist in his day, Pourfour du Petit," says Prof. L., "was the first, in 1727, to show the influence of injury of the cervical portion of the sympathetic system on the eye.[1] He observed contraction of the pupil, retraction of the globe, and redness of the conjunctiva, to result. These observations were confirmed by numerous subsequent experimenters; but, in 1845, M. Biffi, of Milan, added the important fact that when the iris was contracted in consequence of division of the cervical sympathetic, it became dilated if the upper end of the nerve was galvanized. In 1852, Professor Claude Bernard further elucidated the question. He ascertained that the surface became more sensitive and the vessels fuller of blood; that the small arteries pulsated with greatly increased force; and that the temperature was greatly raised on the side of the head operated on, both externally and as to the parts within the cranium; that as to the eyelids and eye there was contraction of the pupil, a narrowing of the opening of the lids, retraction of the eyeball, a projection over it of the third eyelid which the animals operated on possess, and a flattening of the cornea. But when the upper end of the nerve was galvanized these conditions were reversed, and there resulted diminished heat and vascularity, dilatation of the pupil, enlargement of the opening of the eyelids (or staring eye), and protrusion of the globe; in short, he produced exophthalmos.[2] And the tendency to it was so forcible under these circumstances, that the phenomena were manifested in an animal which held the eye tightly shut, in consequence of a drop of liquor ammoniæ having been dropped into it. Here, then, we have a clue afforded as to the nerves and the muscular mechanism involved in nervous exophthalmos.

"Nor is this all. In the increased sensibility, heat, and vascular activity of the side of the head operated on, there is a proof of the influence of local morbid states of the nervous system on the development locally of those phenomena as symptoms. Now, these are leading points to be investigated, and at the first glance it might be supposed (as I certainly was led to think), that the exophthalmos and increased vascular activity in the head, neck, and face observed in these cases, might be attributed to the pressure of the enlarged thyroid on the cervical

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[1] Histoire de l'Académie des Sciences, 1727. "Mémoire dans le quel il est démontrè que les nerfs intercostaux fournissent des rameaux qui portant des esprits dans les yeux."

[2] Comptes Rendus, tom. 36, p. 375.

sympathetic, or to some other lesion of that nerve sufficient to influence its functions. The objections to this theory, however, are manifest. Not only have we numerous examples of very large bronchocele without such results, but exophthalmos frequently occurs when there is no bronchocele. Besides, if this cause be admitted (and in some instances at least it may be a cause), how comes the heart to be in pathological relation with the eyes? In truth, until the last few years, the attempt to solve the questions thus arising was hopeless; happily experimental research has demonstrated a hitherto unknown physiological connection between the eyeball and lids, and a definite tract of the spinal marrow. Two eminent physiologists working together, viz., Dr. Waller and Professor Budge, discovered that if they galvanized that portion of the spinal cord of a rabbit which extends between the first cervical and the sixth dorsal vertebræ, they excited dilatation of the pupil. They, therefore, designated this region the 'cilio-spinal region.' The point of maximum intensity was found to correspond in the frog to the articulation of the second and third dorsal vertebræ, and to the origin of the second dorsal pair of nerves.[1] Following up these researches, Prof. Claude Bernard has recently traced a connection in the dog between the anterior roots of the two first pairs of dorsal nerves and the muscular mechanism of the eye. If these were divided on one side without injuring the spinal cord or the sympathetic in the thorax, the eye of that side is affected, the pupil contracts, the opening of the eyelids narrows, and the eyeball is retracted and diminished; but there is no increased sensibility, heat, or vascular activity induced. And when the peripheral ends of the divided nerves are galvanized, the same results follow in the eye as when the upper end of the cervical sympathetic is galvanized—that is to say, widening of the eyelids, dilatation of the pupil, and exophthalmos. Hence the conclusion, that the motor nerves of the eyes of the dog originate and decussate in the spinal cord at the dorsal region. It is necessary, however, according to the results of Prof. Claude Bernard's researches, to distinguish between the sympathetic and spinal nerves of the eyes. When he divided the ascending trunk of the sympathetic on the side of the vertebral column between the second and third rib, carefully avoiding the spinal cord and nerves, he induced increased sensibility, heat, and vascularity of the ear and lateral half of the head on the same side, but no change in the eyelids, eyeball, or pupil. Hence the conclusion, that the nerves subservient to heat and vascular activity (the vascular and calorific nerves) are sympathetic, those which regulate the movements of the eye are spinal. But these motor nerves are equally with the vascular (including the cardiac nerves), and the calorific in relation with that portion of the cerebro-spinal axis which influences the circulation and muscles of expression when emotions are experienced; and this is true, even of the emotional state of feeling termed pain, for Claude Bernard found that if any sensory nerve be pinched from the sciatic to the fifth, reflex ocular movements result, constituting dilatation of the pupils and widening of the eyelids. I do not propose on this occasion to explain the connection between these conclusions and the causes of the palpitations, arterial pulsations, vascular bronchocele, heat of surface, and increased sensibility, and other symptoms which accompany the exophthalmos, because the subject merits a separate consideration. I would only observe that it has been long known that the heart and vascular system are the seat of various functional disorders of a painful kind, in cases of so-called spinal irritation, especially in young women predisposed to hysteria and hysterical affections. In such patients, nervous and hysterical palpitations, in all respects resembling those of the disease in question, exclusive of the bronchocele and the exophthalmos, are very frequent. Many years ago, I pointed out the fact that the motor fibrils of the heart are derived from the spinal cord as well as from the sympathetic, and thus tried to explain the character and origin of these nervous or hysteric palpitations, and indicated the diagnosis.[2] All the most recent researches on this point tend to establish these views, and to prove that the heart is in direct relation with a special motor tract of the spinal cord, commencing and continuous upwards

[1] Comptes Rendus, tom. 33, p. 372.

[2] On the Nervous Diseases of Women, p. 270. London, 1840.

with this oculo-spinal region. Consequently, any sufficient causes acting morbidly upon that portion of the cord, or upon the cerebral connections within the cranium (as during emotions), or upon the motor roots of the two or three first pairs of dorsal nerves, would tend to induce not only the 'oculo-pupillary changes,' but also increased vascular activity in the region of the cervical sympathetic, and palpitation of the heart. These remarks apply with equal force to certain cephalic symptoms, and which are quite as prominent as the conditions just examined; such as tinnitus aurium, flushes, nervous headaches, neuralgia of the face and orbits, and wakefulness; and also to the precordial anguish, painful sensibility of the trunk, and neuralgia of the spine and upper extremities. Some of these are due to morbid conditions of the cervical sympathetic primarily, others to affections of the ganglia on the posterior roots of the spinal nerves (the intervertebral ganglia), and of the sensory tract, occurring either consecutively to the vaso-motor neuroses, or arising independently. The whole subject is, however, too large in extent to be examined now.

"*Orbital Exophthalmos.*—It is necessary, however, to an accurate diagnosis of the various forms of staring and protruding eye, to examine the relations of the eyeball to the Gasserian ganglion, which is the ganglion of the posterior roots of the nerves of the face; for, undoubtedly, a species of exophthalmos arises in consequence of diseased states of that ganglion. This connection was first demonstrated experimentally by Magendie in 1824, and pathologically by M. Serres in the following year. Of later years Schiff has very successfully investigated the subject. As the experiments of Professor Claude Bernard are more accessible, I need only remark that, by an ingenious method of operating, he divides the trunk of the fifth nerve in rabbits and dogs: the result is, that a degree of exophthalmos immediately takes place, and the cornea becomes more conical.[1] It is, however, of much diagnostic importance to observe that the vascular phenomena which accompany this kind of protrusion of the eyeball are very different from those already described as of spinal or sympathetic origin; for, though turgescence of the vessels of the conjunctiva takes place, the heat and vascular activity of the tissues involved are not increased, but strikingly diminished; so that, when the animal is in bad health, inflammation of the conjunctiva, with opacity and necrosis of the cornea, follow, and the eye is destroyed. And there is a probability, at least, that the effects of the injury are felt in the brain beyond the orbital tissues. Now, as structural disease of the ganglion has been proved by Serres and others, as also my own observations show, to be followed by similar changes, we have in these facts a ground for diagnosing trigeminal or orbital exophthalmos from sympathetic or spinal. In several recorded cases there were myopia, neuralgia, œdema of the eyelids and conjunctiva, passive congestions and inflammations of one eye, or of one predominantly if both were protruded. Such phenomena enable us to distinguish a trigeminal from a sympathetic or spinal exophthalmos, because, in the sympathetic kind, the nutrition of the eye is not only wholly unaffected, but the increased vital activity of the tissues enables them to resist cold and the other causes of inflammation, even although not covered by the lids. This peculiarity of the exophthalmos under consideration is particularly noticed. When the fifth is affected, the results are wholly different. The case communicated to Mr. Fisher by Dr. Désgranges was probably of this trigeminal kind.[2]

"*Sources of Fallacy in Diagnosis.*—It is probable, however, that in a certain class of cases both kinds of nerves are involved, and then the diagnosis will be doubtful. For, when this takes place, there will probably be a remarkable modification of the phenomena as caused by either singly. If, for example, congestion, a lower temperature, defective nutrition, and other changes, have occurred in the eye from injury of the fifth nerve, a lesion of the cervical sympathetic will relieve the congestion and restore the temperature, or, in other words, will antagonize the morbid influence. Claude Bernard found that the temperature of the left ear of a dog fell 3° C. below the right ear after division

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[1] Leçons sur la Physiologie et la Pathologie du Système Nerveux, 1858 tom. ii. p. 51 et seq.

[2] Archives Générales, 1859. Exophthalmie Cachectique, Obs. v. p. 533.

of the fifth on the left side; but, when he divided the left cervical sympathetic, the temperature of the left ear rose 6° C., while that of the right fell 6° C.[1] If, therefore, a case were met with in which both kinds of nerves were involved, the pathognomonic signs of neither the one nor the other class of lesions would be manifested, and thus the singular result would follow of serious nerve-injuries so antagonizing each other as to remain totally obscured. Another source of fallacy in cases of centric origin will be found in a physiological fact almost wholly, if not altogether, overlooked by physiologists, but which I have seen so often illustrated by disease, that I am satisfied it is of frequent occurrence, and that is the crossed action of the sympathetic nerves and ganglia, owing to decussation of their fibrils and commissures in the cerebro-spinal centres.[2] I have seen remarkable examples of this crossed action in anasarca; as, for example, in a woman in the clinical wards in November, 1861, who had valvular disease and the most extreme œdema of the extremities. She had an attack of hemiplegia of the left side, which was due, as the post-mortem examination proved, to plugging of the right middle cerebral artery. Now, there was increased œdema of the right or non-paralyzed leg and arm, but the left leg, which was wholly useless, ceased to be anasarcous, and became quite small. Here the injury to the right hemisphere plainly led to the change in the left limb. To what extent these central changes in the vaso-motor system influence the states of the circulation in distant parts is as yet wholly uninvestigated, but I am inclined to think they modify the production of exophthalmos and the vascular changes in at least certain cases of general paralysis.

"*Ptosis or Drooping Eyelid.*—The condition of the eyelid, as distinct from that of the eyeball, is of importance in diagnosis; there may be a staring eye without a protruding globe. Now, taking the results of Professor Claude Bernard's experiments as a guide, I think it may be inferred that the drooping or partially closed eyelids may be as pathognomonic as the widely open; nay, perhaps more conclusive, inasmuch as paralysis of the cervical sympathetic is much more likely to occur as a morbid state than that half-tetanic, excited condition, which galvanization induces. And it is perhaps for this reason that the staring eye is comparatively so rare. A drooping eyelid, therefore, with or without retraction of the eyeball, together with greatly increased vascular activity in the neck, head, and eyes, may be more pathognomonic than the staring eye with its widely open lids. In the case of paroxysmal exophthalmos or proptosis already referred to, symmetrical ptosis or drooping lid was a very striking symptom when there was no excitement. When one eyelid is affected the lesion is probably local. I had recently an example of this kind in the case of a female patient sent to me from Ireland by a medical friend. He informed me that she had long suffered from dull heavy frontal headache, aggravated by stooping, and accompanied by vertigo, muscæ volitantes, and ringing in the ears, and sometimes with nausea and vomiting. At the same time she had a good deal of thirst, and habitually cold feet. A confined state of the bowels and weakness of the back had come on during the last three years, and, within the last three months, drowsiness, tenderness of the eyes on pressure, intolerance of light, and ptosis, particularly of the left eye, leading to the suspicion of obscure cerebral disease. On examination I found that there was a thick neck and a small bronchocele, of which the right half was larger than the left. The ptosis was now limited to the left eye, the patient being unable to raise the lid, and there was increased heat on the left side of the head. After treatment with extract of chamomile, nux vomica, and sulphate of iron, in small doses, the ptosis and other symptoms disappeared, and the enlargement of the thyroid was now restricted to the right lobe. It is worthy of notice that thyroideal and glandular enlargements had occurred in three or four of this patient's relatives."

Prof. L. draws the following general conclusions from these facts:—

"1. That the exophthalmos under consideration is specially due to disorder of the nervous system. 2. That it varies in character and diagnostic significance accordingly as it is associated or not with other phenomena involving the vas-

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[1] Leçons, etc., tom. ii. pp. 480–482.

[2] See this question mooted in my "Mind and Brain," vol. ii. pp. 400 and 405.

cular system of the heart, and of the eyes, head, and neck—the carotideal as distinct from the vertebral system of capillaries. 3. That it is sometimes of spinal, sometimes of cranial origin; and that in either case its nature and seat may be diagnosed. 4. That it occurs under a variety of morbid conditions of the nervous system.

"If it might be permitted to theorize on the causes of symptomatic exophthalmos from these data, we might conclude that, when it occurs in strangulation, it is probably due to mechanical injury to the cervical sympathetic by the tightened cord or other violent means used; in the emotional form the condition is probably like that when the sympathetic is galvanized, the face being pale, and the eye staring; in certain morbid cerebral conditions, such as mania, with epilepsy and general paralysis, the lesion is probably in the first instance paralysis of the sympathetic, and subsequently of the fifth and seventh; and, finally, that in the class of cases under consideration, when the exophthalmos is symmetrical, it is spinal; the cervical and upper dorsal region being the seat, together with the corresponding cervical and dorsal divisions of the sympathetic; but when unsymmetrical, it is due to disease of the trigeminal ganglion and branches of the fifth pair."

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41. *The Calabar Bean as a Contractor of the Pupil.*—Dr. D. Argyll Robertson states (*Edinburgh Med. Journ.*, March, 1863) that, recognizing the numerous advantages that would flow from the discovery of a substance, which when applied to the conjunctiva should produce effects exactly opposite to those well known to result from belladonna—which would stimulate the muscle of accommodation, and the sphincter pupillæ as the above-named remedy paralyzes them—he had been endeavouring to discover such an agent without success, when Dr. Frazer informed him that he had seen contraction of the pupil result from the local application of an extract of the ordeal bean of Calabar. Dr. R. accordingly obtained some Calabar beans, and made three extracts of varying strength with which he instituted a number of experiments.

"These experiments prove," says Dr. R., "that the local application of the Calabar bean to the eye induces—*first*, A condition of short-sightedness. That this is present, and the cause of the indistinctness of distant vision cannot be doubted, as it is relieved by the use of concave glasses. The fact that objects appear larger and nearer than natural may be attributed to the induced myopia. And, *second*, It occasions contraction of the pupil, and sympathetically dilatation of the pupil of the other eye. We further observe that atropine possesses the power of counteracting its effects, and, *vice versa*, that it is capable of overcoming the effects produced by atropine. The first symptom noticed is dimness of distant vision, and shortly after the pupil becomes contracted; the symptoms also subside in the same order, first the derangement of accommodation, and then the affection of the pupil.

"Let me now say a few words as to the method of action of the Calabar bean. In respect to its effects on the pupil, they might be produced either by causing contraction of the circular fibres of the iris, or by paralyzing its radiating fibres. I am inclined to believe that the contraction of the pupil is due to increased action of the sphincter pupillæ, and this chiefly on the ground that the other effects produced by the Calabar bean can only be explained by an induced contraction of the ciliary muscle—the muscle of accommodation; and as the sphincter pupillæ and ciliary muscle are both supplied by the ciliary nerves, I think the most feasible explanation of the action of the Calabar bean on the eye is to regard it as a stimulant to the ciliary nerves. In favour of this view we have the feeling of straining in the eye shortly after the physiological effects are produced. The alteration, too, in the accommodation of the eye exhibits much of the character of a spasmodic action; thus we find in experiment *third*, after the second application of the Calabar bean, that the extent of distinct vision is limited to 3 inches, viz., from 6 to 9 inches from the eye, but an hour after distinct vision extends to any distance beyond 5 inches. It has also been observed that the accommodation of the eye is not usually affected in cases where contraction of the pupil is due to lesion of the sympathetic (exemplified in a case narrated by Dr. von Willebrand in the *Archiv. für Ophthalmologie*, vol i.,

where contraction of the pupil depended on the pressure of enlarged glands on the cervical sympathetic, and where no affection of the accommodation was present).

"As regards the cases in which this substance may be applied in practice, it is applicable in all instances where atropine is used to render the examination of the eye more perfect or more simple. This includes two classes of cases, those to which dilatation of the pupil is either necessary or desirable to aid ophthalmoscopic examination, and those in which paralysis of the ciliary muscle is necessary, in order to ascertain the state of the accommodation of the eye.

"In cases of retinitis, with photophobia, I think it might be advantageously employed to diminish by contraction of the pupil the access of light to the retina, and this more especially in those cases of this disease where the pupil has been dilated for the purpose of ophthalmic examination.

"The cases, however, in which I should expect this remedy to produce the most beneficial effects are those in which paralysis of the ciliary muscle occurs as a consequence of long-continued debilitating disease. Cases of this kind are occasionally reported as following attacks of typhus or other fevers. The dimness of vision that forms a frequent sequela of diphtheria appears also to be due to this cause, judging from the symptoms detailed by Dr. Begbie in an admirable paper on diphtheria, recently published in this Journal; therefore, in these cases, good effects may be expected from the use of the Calabar bean.

"In cases of ulceration at the margin of the cornea, leading to perforation, or even when prolapsus of the iris has just occurred, as well as in cases where the iris has a tendency to protrude through a corneal wound, the contraction of the pupil induced by this agent might prove serviceable by drawing the iris away from the circumference."

In a subsequent paper (*Edinb. Med. Journ.*, June, 1863), Dr. R. says that the solution of the extract of Calabar bean which he employed became decomposed and fetid by keeping, and produced irritation when applied to the conjunctiva. The substitution of glycerine for water produced a still more irritating application, and he now employs simple syrup as a suspensory medium, which so far as he has tried answers very well.

In the *Medical Times and Gazette* of May 9th, under the head of Provincial Correspondence, is a report of a case of dilated pupil, with confused vision, the result of a blow on the eye with a stone, the details of which Mr. Neill had laid before the members of the Liverpool Medical Society, in which the Calabar bean had proved most serviceable in causing contraction of the pupil and improvement of vision, and this after veratria had been employed without producing any benefit. Although it is not mentioned, the dimness of sight in this case in all probability depended on paralysis of the ciliary muscle, which condition being corrected by the use of the Calabar bean, distinctness of vision returned. This is the more likely to be the case, as, in almost all cases of simple dilated pupil, affection of the accommodation due to paralysis of the ciliary muscle is found to be present.

In a letter published in the same number of the *Medical Times and Gazette*, Mr. Woolcott testifies to the efficacy of the ordeal bean as a myositic or contractor of the pupil.

Mr. Soelberg Wells has also had successful results from the use of the Calabar bean in a case of paralysis of the ciliary muscle and sphincter pupillæ.

[We have found a solution of acetate of strychnia dropped upon the conjunctiva to produce the same effect on the muscle of accommodation, and on the sphincter pupillæ, as is stated to have resulted from the use of the Calabar bean. We have been for a number of years in the habit of resorting to the strychnia with that view, and generally with satisfactory results.

Early in April last, an officer of our navy was brought to me by Dr. Morris, labouring under paralysis of both the constrictor of the pupil and the muscle of accommodation in one eye, which was the more distressing, inasmuch as the sight in the other eye had long been extremely defective. In this case the solution of strychnia produced the most marked effect, and in about six weeks he was able to return to duty with his pupil of its natural size, and his presbyopia relieved.—EDITOR.]

42. *Two Cases of Monocular Cataract; with remarks.* By Ernest Hart.—In operating on the 4th of March last for the extraction of a fully formed cataract, Mr. Hart observed that some surgeons were of opinion that monocular cataract, when fully formed, should always be removed. The present case was that of a young woman, in whom the cataract had formed, without any very apparent cause, in the left eye, the sight of the right eye remaining good. The patient was young and unmarried; the cataract was a considerable deformity; it altogether abolished sight; monocular vision was insufficient for many purposes of life: he did not hesitate, therefore, to extract. Early extraction had been advised in various cases; and an able foreign writer had brought forward a good deal of evidence and argument to show that the existence of cataract in one eye tended, by reflex influence on the nutrition of its fellow, to hasten the production of opacity in the corresponding lens.

In the same ward with the patient just operated on, Mr. Hart mentioned that there was another female in whom also he had extracted the lens for monocular opacity, with resulting benefit, and whose case afforded a striking illustration of the activity of the reflex influence. This was a young woman who had been sent for treatment, as having "suddenly become blind." When brought to the hospital she groped about in darkness, and could not avoid even large objects, requiring to be led and directed at every step. On examination, the right eye showed a lense very opaque, and partially dislocated. The upper part of its suspensory ligament was ruptured, and it moved backward and forward, attached by the lower edge as by a hinge. The iris was paralyzed and tremulous; the eyeball very soft. There was perception of light to a limited extent on artificial lateral and oblique illumination being practised. The left eye was examined ophthalmoscopically. The cornea was natural, and there were no external signs of inflammation; but the transparent media of the eye were so generally turbid and partially opaque that the fundus could not be fully lighted or diagnostically examined. The history was unusual, and very interesting. Partial blindness had come on suddenly in the *right* eye the day after accouchement, with a sudden pain. On being questioned, she said she had just before struck herself a slight blow over the *left* brow. But this did not seem sufficient to explain the partial dislocation of the right lens. The lens thus partially dislocated had become rapidly opaque, and gradually sight had gone from the left eye. Mr. Hart looked upon this affection of the left eye as being in great measure due to the reflex injury to nutrition caused by the dislocated and partially disorganized state of the right, in which the lens was as a foreign body; and therefore, immediately on the admission of the patient, he proceeded to extract the lens. As the iris was in its upper and outer part lying against the cornea, he made a lower section by penetration at the inner angle, using a Beer's knife mounted on a bent stem, which facilitated that proceeding. The section and extraction were thus effected without wounding the iris. The vitreous humour was very fluid, but comparatively little was suffered to escape. The looked-for effect of the operation upon the opposite eye has been satisfactorily and rapidly developed. How far sight will be restored in the partially disorganized ball from which the dislocated lens was removed is of course doubtful; but in the right [left?] eye vision was largely restored, so that on the eighth day the patient could see to feed herself, to move about, and to assist somewhat in the dimly-lighted ophthalmic ward. Mr. Hart observed that, besides the interest which attached to the case as an instance of reflex nervous influence on nutrition, the nature of which Dr. Brown-Séquard had fully exposed in his important physiological works, the origin of the dislocation was worthy of study. Parturient women were apt to fall into a state of weakness in which such rapid failures of nutrition were wont to occur, and he believed that the dislocation was probably spontaneous and due to that cause. Throughout the convalescence from the operation he had treated the patient with full doses of tincture of the sesqui-chloride of steel, and meat and beer; and he thought that if the old antiphlogistic system had in any measure been adopted, the patient would probably have been blinded for life in both eyes. Several of the affections of the eye were modified in an interesting manner by parturition and lactation, and their treatment should be similarly altered.

[We lay these cases before our reader because they possess some points of

interest, though we are not prepared to indorse the theoretical views of Mr. Hart. We have seen so many cases of monocular cataract, in which the other eye remained for a long period in its normal condition that we cannot believe the existence of cataract in one eye often tends, by reflex influence on the nutrition of its fellow, to hasten the production of opacity in the corresponding lens. This opinion we believe to be purely hypothetical.

With regard to the second case, the affection of the left eye, it seems to us, was most probably simply a repetition of the same morbid action which had disorganized the right eye; though doubtless after the lens of the right eye became dislocated it acted as a foreign body, and must have exerted an injurious influence on its fellow.]

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43. *Acute Glaucoma successfully treated by Iridectomy.*—Mary W——, aged 73, a monthly nurse, always had good health, and up to Christmas last had never suffered any inconvenience or annoyance whatever from her eyes. One night about that time, whilst nursing a lady, and after two or three nights' watching, during which she had little or no sleep, she was, whilst half dozing in a chair, aroused with fright by a noise produced by the breaking of the window-rope, causing her to think that some one had entered the room. This occurred at two o'clock A. M. An hour or so after this, she had violent pain in the left eye and in the head, accompanied by nausea, but no vomiting. The pain was so severe that she remembers no other symptom. At nine o'clock in the morning she was quite blind with that eye, and unable, she says, to distinguish light from darkness. She did not apply for any advice, nor undergo any treatment, although the eye continued exquisitely painful, and from her account seems to have become acutely inflamed. Compelled to leave her situation, and wanting almost the common necessaries of life, she came to the Royal London Ophthalmic Hospital, and was admitted on the 6th February.

*State of the left eye on admission.*—The whole globe acutely inflamed; tension extreme (T 3); the cornea rough and semi-opaque, and the humours within, as far as could be seen, quite dull. The eye was intolerably painful; indeed, it was on account of the unbearable pain, as she described it, that she sought for relief, and was willing to undergo any treatment to gain it. She had no perception of light.

As the eye was useless, very painful, and clearly undermining the patient's health, Mr. Bowman removed it. After the operation all pain ceased, and for a few days she progressed most favourably. She was again able to sleep and to take her food, and expressed herself as feeling quite well.

On Feb. 12th, six days after the excision of the eye, she was at two o'clock in the afternoon seized with pain in the right eye, and she saw, she says, beautiful colours like a peacock's tail in the sun. The pain in the eye increased, and so severe was it at the top of her head that she felt she could hardly rest on her pillow. She did not vomit, although she had a great feeling of sickness. In the evening she saw around the candle in the ward a large rainbow, and the light of the candle appeared red.

On the following morning (the 13th) she was seen by Mr. Bowman. She had passed a very restless night, and the pain in the eye and head continued. The tension of the globe was increased (T 3). She was unable to read letters of No. 20 of Jaeger's test-types, or even to discern features, and could only just manage to count fingers at the distance of six inches. Under these circumstances Mr. Bowman at once performed iridectomy, removing a large portion of iris in the upward direction. Soon after the operation she began to experience relief. She passed a good night without opiates, and in the morning there was a decided improvement in the sight. She continued to progress most favourably, the tension of the eye became permanently normal (T n), and all pain in the eye and head completely left her. In about a fortnight she was discharged from the hospital to attend as an out-patient.

Her sight has steadily improved since the operation, and the report (May 4th) states that with a 20-inch focus convex glass she is able to read No. 2 or pearl type. The convex glass she is obliged to use for reading is not so strong as is ordinarily required at the advanced age of this patient.—*Lancet*, May 23, 1863.

## MIDWIFERY.

44. *Displacement of the Bladder as a Cause of Tedious Labour.*—Dr. W. H. Broadbent, read before the Obstetrical Society of London, March 4, 1863, a communication, the purport of which was to show that, besides the mechanical obstruction which may be presented by the prolapsed and distended bladder to the descent of the head of the child, prolapsus of the bladder, complete or partial, frequently renders the first stage of labour long and painful. The uterine contractions, causing pain in the displaced bladder, it was said, were replaced by spasmodic contractions of the abdominal muscles, which forced down the uterus, but had no effect in dilating its mouth. These were attended with much suffering, of a character very different from the natural labour pains at this stage, which with tactile examination would lead to a recognition of the cause. The measures recommended for the relief of the pain and for expediting the progress of the labour were the supine position, prevention of accumulation of urine by the use of the catheter, and, in severe cases, chloroform. Cases were given in support of these conclusions.—*Med. Times and Gaz.*, April 18, 1863.

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45. *Case of Utero-Placental Adhesions which gave rise to severe Symptoms.* By Dr. Delord.—The questions of inflammation, adhesions, retention, and absorption of the placenta, are still enveloped in sufficient obscurity to authorize every practitioner to endeavour to throw light upon them by his personal experience. I may, therefore, be permitted to publish an observation which appears to me interesting, in reference to the above points.

In the month of May last, I was sent for by the wife of a notary, who was entering upon the ninth month of her first pregnancy. Although I could recognize no sign indicative of the commencement of labour, Mrs. A. experienced dull constant pains in the loins and abdomen. Movement somewhat increased these pains, but not to such a degree as to render them insupportable. I prolonged my examination; and pressure, carefully and methodically exerted over the whole surface of the uterus, having failed to discover any sensitive point, I concluded that the seat of the pain was situated more deeply. Pressed by my questions the patient stated, that independent of the lumbar and abdominal pains, she experienced a peculiar dull pain, which was constant, and was located in the right portion of the fundus of the uterus. This avowal removed all the doubts I might have entertained, and I considered myself justified in diagnosing an inflammation of the placenta, to combat which I prescribed repose, a light diet, and injections. Under the influence of this treatment Mrs. A. felt better, but she still experienced an unusual sensation, a sort of weight and dragging in the region of the uterus. The result proved that, in referring this sensation to the existence of utero-placental adhesions, I was not deceived. On the 18th of the following June, Mrs. A. was delivered at the full time of a healthy infant. Under any other circumstances I should have waited, according to the obstetrical rule I have laid down for myself, the natural expulsion of the placenta; but as in this case I had serious grounds for apprehension, I applied slight frictions over the uterine region, hoping in this way to give rise to some effectual contractions, and so to hasten the delivery. At the end of half an hour of vain expectation, I administered a full dose of the decoction of ergot. The effect of this soon seemed to manifest itself; but at the same time the patient turned pale, and I discovered that internal hemorrhage had taken place. The cord, rendered friable by inflammation, gave way under the traction which I considered it right to employ without delay. I introduced my hand into the uterus from which a gush of blood took place; fainting fits succeeded one another, and the poor mother seemed on the point of death. In this critical situation I compressed with my left hand the abdominal aorta; then, by means of my right hand introduced deeply into the uterus, I separated all that part of the placenta which could be detached, pinching at the same time the inner surface of the uterus, with a view to provoking salutary contrac-

tions. This manœuvre was crowned with success, and the patient was thus saved from the immediate danger of hemorrhage. But if the condition of matters was now less alarming, the fact of the retention of a considerable portion of the placenta could not but inspire me with inquietude. A consultation was held, and the unanimous opinion was, that the sole indication for the present consisted in sustaining the strength of the patient, and in extracting the remains of the placenta by every possible means. The next day the pulse became rapid, and the abdomen became somewhat painful over the uterine region. During the following days a sanious and fetid discharge took place from the genital organs. There were occasional rigors, extreme prostration, and other signs of purulent absorption. The treatment consisted in the administration of beef-tea, sulphate of quina, and cinchona wine, and in the employment of detersive and disinfectant injections. As to extracting the remains of the placenta, the idea required to be abandoned, as the patient peremptorily refused to allow any such attempt to be made. Nevertheless, after a few days, a portion of the placenta was expelled naturally, when, for a second time, alarming symptoms threatened to compromise the life of Mrs. A., which, however, yielded to the treatment previously employed. On the 14th of June a second fragment of the placenta was expelled. From that time the amelioration was progressive and uninterrupted. Convalescence was established in the course of the fourth week, and on the 30th of August I could convince myself that the health of Mrs. A. was perfect.

In this case, as in another which occurred to me in 1840, absorption of the placental substance retained in the uterus by adhesions consecutive to plastic inflammation of the placenta, took place without accident. The symptoms of putrid absorption observed in the present case depended exclusively on the presence of fragments detached from the mass of the placenta, as was proved by the circumstance that, after the expulsion of the fragments, all the dangerous symptoms disappeared. From these facts we may conclude that resorption of the placenta is only possible when it has been united to the surface of the uterus by means of an organized plastic growth, and when a common life has been established between the two organs by means of vessels of new formation. Under these circumstances, resorption may take place without any bad symptoms. If, on the contrary, the placenta has separated in a mass, it is only susceptible of diminution by means of putrid decomposition, and then it acts as a foreign body and as a source of infection, giving rise to accidents which are almost always mortal.—*Ed. Med. Jl.*, June, 1863, from *Journal de Méd. et de Chirurgie pratiques*, March, 1863.

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46. *Ovarian Disease Complicated with Pregnancy.*—The *Dublin Med. Press* of April 29, contains an account of a case in which pregnancy complicated an advanced state of ovarian disease. Dr. Donovan, of Skibbereen, who relates the case, states that the patient, a woman named Mary Fitzgerald, came under his care about four years ago. She was married, and the mother of two children. At that time he detected an ovarian tumour in the right iliac region, which he treated by pressure and iodine inunction. Twelve months after, the bulk of the tumour had so much increased that he determined on paracentesis, and drew off fifteen pints of a thickly gelatinous fluid. She made a good recovery, but five months after, the tumour having again filled, he again performed the operation of tapping, and drew off eighteen pints of a black, muddy-looking fluid, with a very offensive smell. A sharp attack of inflammation supervened; on its subsidence, the abdomen again enlarged, and he had again recourse to paracentesis, evacuating about sixteen pints of purulent fluid, probably the product of inflammation of the cyst. After this he lost sight of the patient for nearly a year. He was then summoned on a dispensary ticket to visit her, and was told by her husband to bring the instrument, as she was in great pain, and required to be tapped at once. He found her in great agony, but the pain recurred at intervals, and from its character he was induced to make an examination *per vaginam*. A child's head was at once discovered in the passage; labour went on regularly, and in a few hours she was delivered of a healthy full-grown infant. The woman died some months after from the ovarian disease.

47. *On the Influence of Vicarious Menstruation on Ovulation.*—Dr. Puech has communicated to the Academy of Sciences, Paris, a paper of which the conclusions are the following:—

1*st*. Vicarious menstruation, supplemental hemorrhage, is said to exist, when at the regular periods a flow of blood takes place elsewhere than from the genital organs.

2*d*. All parts of the body may be the seat of these hemorrhages; nevertheless, they occur more frequently in some localities than in others; thus, in Dr. Puech's cases, they were met with, from the stomach 32 times, from the breast 25 times, from the lungs 24 times, from the nasal mucous membrane 18 times.

3*d*. In all cases which have been carefully observed, antecedents either of hysteria, or of an exaggerated nervous sensibility, have been noticed.

4*th*. In general the menses have been absent (183 times), but sometimes (15 times), at the very time of occurrence of the vicarious menstruation, a slight flow of blood has been noticed.

5*th*. The genital organs are generally healthy, although they have sometimes been found abnormal. In 11 cases there was atresia, either congenital or accidental.

6*th*. With the exception of these last-mentioned cases, absence of the menses does not imply sterility; except in the case of grave disorders, ovulation continues to take place, and the rupture of the Graafian vesicle corresponds with the period of vicarious menstruation.

7*th*. Pregnancy, accordingly, is possible, and has been observed. It suspends the deviation for the time, although it may reappear after the confinement, or at the cessation of nursing.

8*th*. Although compatible with health, and occasionally existing for the whole period between puberty and the time of cessation of menstruation, the deviation is a pathological condition; nay, more, it is not free from danger, having occasionally been the cause of death.—*Ed. Med. Jl.*, June, 1863, from *Gaz. des Hôpitaux*, April 21, 1863.

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48. *Icterus in Pregnant Women.*—Dr. O. Saint-Vel relates that in 1858 the island of Martinique was, without appreciable cause, visited by an epidemic of jaundice, remarkable for its severity in pregnant women. It broke out at St. Pierre towards the middle of April, attained its maximum height in June and July, and terminated towards the end of the year. All races were attacked; the patients were mostly adults; no liver-complication could be detected; nor could any resemblance be traced between the disease and yellow fever. It was fatal to females only, especially during pregnancy. Of thirty pregnant women who were attacked at St. Pierre, ten only arrived at the full period of pregnancy without presenting any other symptoms than those of ordinary jaundice. The other twenty all had abortion or premature labour at the end of a fortnight or three weeks, and died in a state of coma, which appeared a few hours before or after the abortion. The females who died were from the fourth to the eighth month advanced in pregnancy. In some cases, slight delirium preceded the coma, which was never interrupted, but became more and more profound up to the time of death. Its longest duration, in two cases, was twenty-four and thirty-six hours. It was not preceded by any notable modification of the general sensibility, nor of the respiration or circulation. Hemorrhage was absent, except in one case, where a female had it before delivery. When death was delayed till three or four days after delivery, the lochia were healthy. Almost all the children were stillborn; some lived a few hours; one alone survived. None of them had the icteric colour; nor was there any sign of jaundice in the ten children who were born at full term of mothers who had had the disease.—*British Med. Journ.*, Feb. 7, 1863, from *Gazette des Hôpitaux*, Nov. 20, 1862.

## MEDICAL JURISPRUDENCE AND TOXICOLOGY.

49. *Attempt to Restore to its Natural Appearance a Putrefied Dead Body, in order to prove its Identity.*—Dr. B. W. RICHARDSON gives (*Lancet*, May 16, 1863) an account of some very interesting and important experiments which he has made to ascertain whether a human body that had undergone putrefactive change to such a degree as to be unrecognizable, could be so far restored to the appearance of life as to be sworn upon in respect to its identity.

The circumstance which led to this inquiry was as follows: "A woman named Emma Jackson was murdered in St. Giles by having her throat cut in a house of ill-fame, to which she had retired with a man who had been seen by at least three persons, and whose appearance was clearly defined by them. This man, by some strange and almost inexplicable method, made his escape from the house without being seen to depart, and has not since been detected. Several persons have, however, been suspected, and one or two have been temporarily detained, but on examination they have been discharged.

"On Monday, May 4, a man was dragged dead from the Thames, who. in many respects, seemed to answer to the description given of the assumed murderer. On the following Wednesday Mr. Humphreys, the coroner for East Middlesex, held an inquest on the body of this man, but decomposition had advanced so far that none of the witnesses could arrive at any conclusion whatever respecting the body; it was, in fact, utterly unrecognizable. This statement having been made in the public papers on Thursday morning, I formed an opinion, derived from some researches on dead tissues, that it might be possible to alter the appearance of the body so much as to enable the witnesses to speak to its identity."

Dr. R., assisted by Dr. Edmunds, entered on the investigation.

"At half-past ten on Saturday we were taken," says Mr. R., "to the dead man, who was lying in a shell in the dead-house in Darby-street, Tower-hill. He was dressed as he was when taken out of the water. His body generally, with the exception of the hands, was deeply discoloured, and the face was so changed that is was quite impossible to form any opinion respecting either its colour or feature; it was as black as the face of the darkest negro, and had it not been white when he was taken out of the water I should say that the man would have been returned as a negro. The lips were enormously distended, and the nose was scarcely visible; the cheeks and eyelids were also greatly distended. In fact, the putrefactive changes were so advanced that it required some little determination to proceed. Following, nevertheless, the course I had marked out, we immersed the body in water, and then added to the water twenty pounds of common salt; we also added gradually, in the course of the operation, one pint of common hydrochloric acid; and the body was allowed to remain under this solution for two hours. The object of this part of the process was to reduce the swelling of the features by exosmosis. The shell, being water-tight, answered as a bath.

"Meanwhile we charged a pail of water with fresh chlorine, and then, lifting the face out of the water in the shell, treated it with the chlorine water. I also directed a stream of chlorine gas for some time upon the face. The object of this part of the process was to restore the white colour.

"A little before one o'clock both of the intentions we had in view were realized to a considerable degree. The tumefaction was relieved; and the face, from the deepest black, had become of the cast of light clay, common wood-ash, or the darker sort of straw-paper. When the chlorine in vapour was passing over the face the skin approached to white, but so soon as it was withdrawn the change to clay-like hue returned. So much was now accomplished that we were able to form a fair estimate of the man. We found that he was evidently a young man, not more, probably, than twenty-one years of age: he had a short feeble moustache; his lower lip had a short soft beard that had not been shaven, and

his whiskers corresponded; his face was naturally round and full, and, indeed, his body generally was well nourished.

"At one o'clock we left, and returned at two. We had arranged that a stream of chlorine should continue to play over the face in our absence, but, as we had no one to leave in charge, the gas had become exhausted, and the face was a little darker when we returned.

"Pursuing still the course I had pre-arranged, we opened the body. We found the viscera but little decomposed, and natural; the heart was empty and flaccid; the lungs free from congestion. We fixed a large tube in the aorta, through the left ventricle; and Dr. Edmunds tied the aorta in the thorax, so as to prevent any passage of fluid to the lower part of the body, and to the abdominal viscera. Then we injected a solution, consisting of chlorine water, chloride of zinc, and a little sesquichloride of iron. The object in this instance was to impregnate the tissues from within with the decolorizing agent, and to reduce the tumefaction. On forcing the injection, we found that great escape took place through the vessels that had been divided in opening the thorax. We therefore withdrew the tube from the aorta, and as the face was the part chiefly requiring attention, Dr. Edmunds laid bare the common carotid on the right side, and a small nozzle from the syringe was introduced into that vessel and tied. It must be understood that much care was required in forcing the injection through structures so decomposed and yielding, and that we dare not push this part of the operation too far. Had we used much force we should have produced extensive infiltration through the broken capillaries, and have destroyed the facial structures altogether. So soon, therefore, as the face was subjected to slight tension the injection process was stopped. The time had now approached for the sitting of the jury at half-past four P. M. We allowed all the water to drain away, drenched the body with pure water, and left it with the face covered with a piece of thick cloth, on which was poured a little hydrochloric acid and methylated alcohol. The face at this time was of a clayey colour, and a little more full than natural; and although we felt that we had not brought it up to its perfect natural appearance, we believed that it might be recognizable by any one who had seen it during life, and especially that it was a face which a witness could swear was not that of any particular person whom he remembered, if there were not strong natural resemblances between the two.

"The result indicated that we had effected even more than we had anticipated, and that, if we had not succeeded to the perfection we could have wished, we had fulfilled the practical part of our mission and all that was demanded of us; for the three witnesses who were there either to confirm or disprove the hypothesis that the man before them was the man last seen with the murdered woman, each and all swore without hesitation, on their second view of the unknown man, that he was *not* the assumed murderer."

Dr. R. offers the following *reflections* and *suggestions:* "The fact that in a case so extreme as the one named, science has come in to render essential aid to justice, affords, I hope, subject for thought and renewed effort in the same direction. I am far from considering that we ought to stop where we have thus begun. I look upon this case, in fact, as a mere first and experimental trial, which followed up will lead to great perfection in one department of medical jurisprudence; and I feel, consequently, that I cannot conclude this paper better than by pointing out what improvements in the process have been suggested to me by the experience detailed above.

"1. In respect to time. On another occasion I would ask to be allowed at least twenty-four hours for the performance of the process. The period of six hours was insufficient for the full development of the required changes.

"2. I should proceed by stripping the subject of all apparel.

"3. After this the subject should be placed in a water-tight shell, in which a large tap for escape of water should be inserted, and the body should be thoroughly washed with water.

"4. After the washing the body should be covered with water, and held beneath it by a few cross bars of wood. Then the lid of the shell should be temporarily but effectually closed down, and two openings should be made into the lid; through one of these openings the free end of a tube, connected with a

chlorine flask, should be passed beneath the surface of the water; while from the other opening should come another tube, the free end of which should turn over into a glass globe of water. These preliminaries arranged, fresh chlorine should be driven in until the water within is saturated by it, the fact of saturation being determined by the passage of chlorine through the escape-tube. When the water around the body should thus become charged with chlorine, the openings in the lid of the shell should be closed, and the whole should be left undisturbed for twelve hours.

"5. On opening the lid after the interval of time named, common salt should be added to the water, until the hydrometer should stand several degrees above the specific gravity of the blood; the specific gravity of 1,100 would answer for the solution. In this solution the body should remain immersed for twelve hours; the water should then be drawn off and the body examined.

"[If there were no deep decomposition and discoloration, the body, I believe, would now be ready for identification; but if the putrefaction were very deep-seated, it would be requisite to proceed further.]

"6. If necessary, open the trunk of the body at this point, and make any post-mortem observations that may be required. The head should not be opened at this stage.

"7. After the post-mortem examination, in order to restore a more natural expression to the face, solutions should be injected into the external carotid of each side. The form of solutions I should suggest in another case would be—

"(*a*) Water saturated with chlorine, and charged, in addition, with tincture of the sesquichloride of iron in the proportion of two fluidrachms to the pint.

"(*b*) Common fresh milk saturated with common salt.

"Of injection *a*, I would recommend that from two to three ounces should be slowly injected on each side, to be followed, without removing the nozzle of the syringe from the vessel, by so much of solution *b* as should cause the slightest possible tension on the tissues of the face.

"Lastly, if it were requisite to retain the body for some time, it would be advisable to cover it with wood spirit, containing one drachm to the gallon of the tincture of sesquichloride of iron, and to exclude it from the air.

"In offering these suggestions, I beg that they may be accepted as open to revision; the principle recognized, the details are certain, under experiment, to be simplified and improved.

"In conclusion, I have to offer my warmest thanks to Dr. Edmunds for the energetic, friendly, and able part which he took in the very interesting inquiry to which I have called attention. His exertions contributed in a most important manner to the results obtained.

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50. *Siguatera, or Fish-poison Disease.*—There are six varieties of poisonous fishes already known and described—viz.: the perches, the gurnards, the flounders, the spares, the gobies, the sardines, and the globe fishes, the last including two forms—the *Diodon* and the *Tetrodon.*

Confining our attention exclusively to these poisonous fishes, we find that they are most common in the following localities—at all events, that they have been discovered in these localities more frequently than elsewhere: in the Caribbean Sea, off Brazil, New Caledonia, the Seychelles, the Chinese Sea, the Malabar coast and other parts of India.

It should be remarked, that in these poisonous fishes the digestive organs, the spawn, and the liver, are invariably most dangerous; and that there are many fishes that may be eaten with the greatest safety when those parts are avoided. Another fact worthy of notice is the age of the fishes: some are dangerous when they have arrived at maturity. The *Lethrinus mambo*, for example, can be safely eaten when very young, but afterwards is exceedingly dangerous. Some naturalists attribute the poisonous qualities to the food found in the seas frequented by certain classes of these fishes. This is true under some circumstances, as in the case of the *Meletta venenosa*, which at certain seasons of the year feeds upon a green monad which covers the sea in large quantities. Wherever this green monad is seen the *Meletta* is poisonous, but wherever it has

not appeared the same fishes are eaten with the greatest safety. MM. Fonssagrives and Méricourt, agree with M. de Rochas in his opinion respecting the spawn, and with him consider it as the most poisonous part. If such be the case, it could soon be determined by ascertaining whether the injurious properties of the fishes are permanent, whether in the same species adults only are poisonous in their effects, and whether there is poison in those fishes only which contain spawn. To decide these questions, comparative experiments might be made with the male and female fishes of the same species inhabiting the same streams or waters. If it were found that the latter only were injurious, the difficulty would be satisfactorily solved.

The Spanish colonists gave the name of *Siguatera* to that union of symptoms which results from the eating of poisonous fishes indigenous to hot countries. The symptoms which arise are of two kinds. Severe attacks of indigestion or gastro-enteritic poisoning; or an icy coldness and depression. accompanied with great nervous disturbance. The symptoms are the same, whether severe enough to cause death, or only to excite inconvenience or temporary derangement; they differ only, i. e., in intensity. Gastro-enteritic *Siguatera* has all the appearance of a severe attack of indigestion—viz., nausea, vomiting—first of the food, then of mucus—coldness, depression of the pulse, cramp, and diarrhœa. The nervous type of symptoms—viz., convulsion and paralysis, which characterize the process of poisoning by fishes, are not to be found in any case of metallic poisoning. They seem to arise from a combination of accidents, as if they had been produced by different vegetable poisons of narcotic and acrid character. When the *Siguatera* assumes a gastro-enteritic form, the sufferer is, in general, quickly restored to health; while the nervous symptoms leave behind them the most serious traces of debility and irregularity. These have been known to continue for eight or nine days.

As illustrating the way in which the members of crews of vessels are poisoned by the eating of poisonous fishes, the following facts from the "Linnæan Transactions" for November, 1860, are valuable. The history of the circumstance was communicated by Mr. H. Jameson, of her Majesty's ship *Winchester*, to Sir William Burnett. The accident occurred on board the Dutch ship *Postillion*, lying in Simon's Bay, Cape of Good Hope. The *Winchester* being near Mr. Jameson was called to render his services to the sufferers. On arrival he found that the boatswain's mate and purser's steward had been suddenly taken ill after eating a part of a well-known deleterious fish, common in Simon's Bay, and called the toad or bladder-fish—the *Diodon*. They had been warned that the fish was poisonous, but were resolved to try the experiment, the boatswain declaring that the liver was not poisonous, but a great delicacy. They had partaken of dinner at twelve o'clock; immediately afterwards they partook of the fish, and scarcely ten minutes had elapsed when the boatswain became so ill that he was unable to raise himself without the greatest difficulty; his face was somewhat flushed; his eyes glistened, the pupils were rather contracted; his mouth was open; the lips were tumid and somewhat blue; the forehead covered with perspiration; the pulse weak, quick, and intermittent. The patient was extremely uneasy and in great distress, but still conscious; he complained of pain from constriction of the throat, and appeared inclined to vomit. It was with difficulty he could swallow a powder with some warm water. His state quickly assumed a paralytic form; his eyes became fixed in one direction; his breathing was difficult, and accompanied with dilatation of the nostrils; his face was pale, and covered with cold perspiration, his lips livid; his consciousness and pulse failed, and in scarcely seventeen minutes after partaking of the fish he was dead. The symptom exhibited by the purser's steward were of a similar kind. He also died within twenty minutes of the time after he had partaken of the fish.

The quantity consumed between the two men was only the liver of one fish; the liver might have weighed about four drachms. The entire fish measured only from six to eight inches in length.

Other examples similar to the above have been recorded by Præger; in all death was rapid, but we cannot stop to chronicle these, as the effects were the same as in the instances above cited.

It is worthy of note that some of the poisonous fishes are as hurtful to inferior animals as to man. Several illustrations of this fact have been collected. Dr. Collas, chief of the marine department of health at Pondicherry, had occasion to inquire into the poisonous nature of the goby, as he had been informed by the director of police there that several accidents had occurred in a native Mussulman's family of three persons, who had partaken of a dish made of some small fishes called in Talmic *Culou-oulouve*. The head of the family also told Dr. Collas that three fowls had died soon after eating some of the same dish. A native doctor or "*mestris*" repeated this experiment of feeding fowls on the fish, and with the same result.

At eight o'clock in the morning, Dr. Collas gave to one chicken three heads, and to another four heads of these fishes; at half-past nine the symptoms began, at eleven o'clock they increased, between one and two the poisoned animals died, without convulsions, in a state of extreme prostration. In a second experiment, the bodies of these same fishes were used which the heads had been taken off. The animals suffered from the same symptoms, but less severely, and were quite well the next morning.

The livers of ten gobies were administered to one chicken, and killed it in two hours. The intestines of ten of these fishes, separated from the livers, produced the same results. The entire fishes, deprived of their livers and intestines, caused death in four hours and a half, in other experiments.—*Social Science Review*, July 19th, 1892.

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51. *Antidotes for Strychnia.*—Professor RANIERI BELLINI, after conducting a long series of experiments on poisoning by strychnia and its salts, arrives at the opinion, that the best antidotes are tannic acid and tannin, chlorine, and the tinctures of iodine and bromine. Chlorine, he maintains, attacks the strychnia even when it is diffused through the system; for he found that in rabbits poisoned with the sulphate of the alkaloid, on being made to inhale chlorine gas in quantity such as was not sufficient in itself to kill, the convulsions were retarded, and were milder when they occurred; death also was less rapid. The author further observed, that when strychnia was exhibited with pyrogallic acid, the convulsion was retarded for the space of half an hour, in comparison with other experiments in which the alkaloid was given by itself. Professor Bellini believes that this arrest in symptoms is not dependent on the acid acting chemically on the strychnia, but only through the astringent effects produced by the acid on the mucous membrane of the stomach, whereby the absorption of the poison is rendered difficult. The same author, dwelling on the frog-test for strychnia, asserts that this test is not to be trusted, inasmuch as other poisons produce the tetanic symptoms, although in a lesser degree. He adds, in speaking of the effects of the antidotes to which reference has been made, that he trusts his results will have a bearing not only on the treatment of strychnine tenanus, but on traumatic and idiopathic tetanic disease.—*London Medical Review*, June, 1863, from *Annali di Chimica*.

# AMERICAN INTELLIGENCE.

## ORIGINAL COMMUNICATIONS.

*Radical Cure following an Operation for the Relief of Strangulated direct Inguinal Hernia.* By SAMUEL J. JONES, M. D., Assistant Surgeon U. S. N.—C. D., a sailor attached to a gunboat on the blockade, on the 12th of March, attempted to raise a navy gun-carriage supporting a 100-pounder Parrott gun. On the following day, March 13, he complained to the medical officer of the vessel, Act.-Assist. Surgeon Henry, of having pain in his "stomach." An anodyne was given him, and no further complaint was made by him until about 1 o'clock A. M. on the morning of the 14th, when he complained of pain in his groin, and some swelling. Examination revealed inguinal hernia of the right side. An effort to reduce it by taxis was made, which proved unavailing. An enema of infusion of tobacco was given, and the effort to reduce by taxis was repeated, but without success. At 7 A. M., a nauseant was given him, and during the relaxation from that, another trial was made to reduce it by taxis, which also failed. At 11 A. M., on the same day, I was asked to see the patient, and to operate to relieve the strangulation. After learning the history of the case, we concluded to etherize the patient thoroughly, and apply ice to the base of the tumour, and make one more effort by taxis before operating. This, too, failed to produce the desired result, and at 3 o'clock P. M.—about 48 hours after the hernia was produced—whilst the patient was again under the influence of ether, I cut down upon the tumour, under the impression that it was indirect inguinal hernia, which had become strangulated at the external abdominal ring. As soon as I opened the sac, I found that there was no constriction at the external ring, nor was there any portion of the intestine in the inguinal canal. A portion of the intestine, about the size of a small hen's egg, rested on the spermatic cord, outside of the external ring. It was almost black, and was immovable at the point of constriction, which proved to be in the conjoined tendon, on the inner side of the internal column of the external ring. With difficulty I succeeded in getting a blunt-pointed bistoury upon the point of constriction, which was small, and not unlike the stem of a mushroom, beneath the larger crown. By careful and constant pressure I succeeded in getting the bistoury introduced through the stricture. Then, by slightly rotating the bistoury, I enlarged the artificial opening in the conjoined tendon, and drew out the bowel a little distance, and soon had the gratification of seeing the blackened hue of the bowel replaced by more of a mahogany colour, showing that the circulation was being re-established in the part. After waiting a few moments for this purpose, I again introduced the knife, and enlarged the opening sufficiently to enable me to return the bowel to the cavity of the abdomen, which I did by carefully kneading it. As soon as the bowel was replaced, the incision was closed by a few sutures and adhesive strips, and covered with a compress and roller. At 10 P. M., the patient took an anodyne, and rested well during the night. On the morning of the 15th

his pulse was 80, and full and strong. A saline aperient was given him, and arrowroot diet. Later in the day, there was slight arterial excitement, and his bowels had not been relieved. His pulse was controlled by small repeated doses of tartar emetic, and enemata of warm water were administered, followed by fecal discharge.

On the 16th he was doing well, and was transferred to the U. S. Naval Hospital at Portsmouth, Va.

Subsequently, I learned from Surgeon Wales, U. S. Navy, who attended him whilst there, that, after several days in the hospital, decided peritonitis followed, which yielded to opiates and general antiphlogistic treatment.

His recovery was delayed by repeated imprudence in his diet during his convalescence, but he eventually recovered, and it seems the cure is radical.

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*Fracture of the Thigh by a Minie Ball.* By Armistead Peter, M. D., Ass. Surg. U. S. A., Seminary Hospital, Georgetown, D. C. (Extract from a letter to the editor, dated June 11, 1863.)

My attention has been called to an article in your journal of April, 1863, by Dr. Carothers, on fracture of femur, and in justice to myself and associates I must take upon myself to correct Dr. C.'s views concerning the case which he saw at the Seminary Hospital.

Lieut. Joseph Tall, 86th N. Y. volunteers, was wounded in the seven days' fight, Pope's campaign. Having laid in an old barn for *ten days*, he was brought to our hospital September 9th, and placed in my ward. Upon examination I discovered a fracture of the right femur, about two inches *below the trochanters*, and not extending *into* the trochanters (also another wound immediately below the left clavicle, the ball making its exit above the left scapula; this wound healed kindly, and gave but little inconvenience). The fractured femur was immediately placed in one of Professor Smith's anterior splints, and the leg suspended. Although a man of indomitable pluck, he was very weak when I first saw him. My patient for two weeks did remarkably well, when he complained of pain at the fracture. I assisted Surg. B. A. Clements, U. S. A., when he readjusted the splint, which had become slightly displaced; pain was relieved, and the patient did well for several days, when symptoms of pyemia set in. Under judicious treatment the pyemia subsided, and he was once more cheerful, *when unfortunately the adhesive strips which supported the splint and leg became displaced, very little, it is true, but still enough to move the upper suspending* cord *above* the point of fracture. *This caused* the upper fragment to become depressed, whilst the lower one was raised in proportion; the consequence was that apposition was wanted, and the rough serrated edges of the two bones being brought in contact with the muscles, intense irritation ensued. Sunday, 28th September, I discovered the cause of complaint, and reported the circumstances to the surgeon in charge, F. Hinkle, late of the U. S. N. We immediately concluded to etherize the patient and make a thorough examination, which we did, and found but one piece of bone separated from the shaft, and that was *perfectly square*, about *an inch* (*not more*) in diameter. This was removed. We found the fracture to be oblique, and the edges roughly serrated. The leg was very painful at this time. Dr. H. and myself expressed our opinion freely about amputating and exsecting, but concluded to wait until the next day, Monday, September 29th, when Surgeon Clements (who had charge of all the hospitals here) would see the case again. Lieut. Tall was perfectly satisfied to have his leg amputated, and so expressed himself. Dr. Clements exa-

mined the case, and, upon consultation, we three determined to run the risk of reapplying the wire splint. A. A. Surgeon Warner, from Baltimore, Md., who had seen Dr. Smith apply his invention, was called up from the second ward, and he and myself refixed the leg. Together we watched it carefully, and from that day up to the 22d of December, 1862, when he left for home, he continued to improve. His leg is about two inches short, but he manages to walk very well with the aid of a cane. Dr. W. deserves the credit of the cure, for his untiring devotion to the Lieutenant I really think was the means of saving the limb.

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## DOMESTIC SUMMARY.

*Bromine in Hospital Gangrene, Erysipelas, &c.*—Dr. J. H. Brinton, Surg. U. S. V., appointed by the Surgeon General to investigate the character of the Hospital Gangrene, Pyæmia, and Erysipelas prevailing in the U. S. Hospital at Louisville, and the different modes of treatment there employed for those affections, has made the following interesting report:—

On my arrival in Louisville, I called on Surgeon M. Goldsmith, U. S. V., the Medical Director of the Louisville Hospitals. In company with him I visited the principal military hospitals in the city and vicinity, and carefully examined the various cases of hospital gangrene and erysipelas therein contained. The type of the former affection at the period of my visit was somewhat similar to that which I had previously observed in the U. S. A. General Hospitals at Annapolis, but, although of analogous form, the disease did not appear to me to be of so virulent a grade; whether this was due to the original character of the affection or to the effect of the remedial measures employed, I am not prepared properly to decide. Nearly all the cases observed by me were in the stage of reparation, and but very few in the period of progress. The shape of the ulcers was characteristic, as was also the appearance of the gray slough, but the tendency of the sores to burrow deeply, and to extend rapidly, was not well marked at the time I examined the cases, some thirty in number.

The treatment almost universally adopted in the Louisville hospitals is that originated and introduced by Surgeon Goldsmith, U. S. V. It consists in the direct local application of bromine, either pure or in solution, to the surfaces of the sloughing sore. Due care is always taken first to remove as thoroughly as possible the sloughs, so that the agent may act on the living tissues, and permeate them to some extent. In cases in which the burrowing is so extensive and deep-seated as to render the application of bromine difficult or incomplete, Dr. Goldsmith resorts to hypodermic injections of bromine at the circumference of the sore. The punctures with the point of the syringe are made at intervals of from one-half to three-fourths of an inch, and one drop of pure bromine is thrown into the tissues at each application. The mode of dressing the surface of the sores with the bromine was exhibited to me by Dr. Goldsmith. From my observation of the immediate effect of the reagent upon the diseased tissues, and of the condition of the sores upon which it had been previously applied, I am inclined to look upon the remedy as one of great value, and well deserving of a fair and extended trial.

Surgeon Goldsmith declared to me that in forty-eight hours the specific character of any sore, the result of hospital gangrene, can be destroyed by a thorough use of the bromine. The arrest of the virulent process is at once evinced by the absence of the peculiar odour, and by the marked change for the better which immediately ensues in the constitutional symptoms.

From conversation with Surgeon Goldsmith I inferred that he regarded hospital gangrene as essentially a local affection, and that as soon as a decided local impression is produced upon the sore all danger to life is averted.

The whole number of cases of hospital gangrene treated in the Louisville hos-

pitals up to this time amounts to eighty-eight. But two deaths have occurred, and in these instances the disease was complicated with a very extensive inflammation of the cellular tissue.

I would remark that in the Louisville hospitals but little tendency has been observed in the disease to spread from bed to bed, although isolation of the gangrenous patients has not been enforced. In my own judgment the absence of this tendency to infection tells strongly against the supposed virulence of the affection, and should even throw doubts on its true nature, at all events in some instances. Assuming the disease, however, to be the veritable hospital gangrene, the facts connected with its origin were peculiar. The disease occurred almost always in patients who had been wounded at the battle of Murfreesboro', and who had been retained in crowded hospitals for some time previous to their transportation to Louisville. I am informed by Surgeon Thurston, U. S. V., Medical Director of the Nashville hospitals, that no one upon whom the gangrene had already appeared was ever sent from Nashville, and yet many were so infected when admitted to the Louisville hospitals. The development of this disease on the route seems to have been owing to the fact that the transportation of the wounded was effected by means of crowded and ill-ventilated boats, and that the trip by the Cumberland and Ohio Rivers frequently occupied several days. During this time these patients, who had already undergone much suffering, were exposed to all the influences most apt to engender this disease. In contrast with this fact it was found that, as soon as the Louisville and Nashville Railroad was opened, so that the wounded could be conveyed from city to city in one day, all importation of gangrenous sores into Louisville ceased. The development of hospital gangrene during the boat transportation is a noticeable fact, and is strikingly analogous with the same phenomena observed among our paroled wounded prisoners from Richmond, received into the Annapolis General Hospital some months since.

*Erysipelas.*—Two hospitals are especially set apart for this disease in Louisville (Nos. 19 and 20), both at some distance from the city, and originally country residences. These buildings are located on rising grounds, are well ventilated, and are tolerably well suited for their present purposes. All cases of erysipelas occurring in the city are at once sent thither, and strict isolation is enforced.

The whole number of cases of erysipelas treated at Louisville was two hundred and twenty-eight; of these ninety-seven were treated in Hospital No. 19, one hundred in Hospital No. 20, and thirty-one cases in Hospitals Nos. 4, 8, and 10. Out of the whole number fifty-one died, and one hundred and seventy-seven recovered.

*Treatment.*—In the application of bromine to the treatment of erysipelas, two different methods were employed: first, by the action of the vapour of bromine in the affected part; second, by a direct application to the erysipelatous surfaces of a solution of bromine of varying strength. In the first method the part affected was enveloped in a dry lint, a cloth saturated with pure bromine was then applied over this, and the whole dressing covered with a piece of oiled silk. The only objection to this treatment was the tendency of the bromine to blister the skin by soaking through the intervening layer of the lint. The other mode of using the bromine is to apply directly to the inflamed integuments a solution of the bromine and bromide of potassium, of the strength of from fifteen to forty drops of the former to an ounce of water. An ample opportunity was afforded me to observe the results of this treatment in the disease in question, and I have no hesitation in pronouncing it one which, so far as I have seen, is of the greatest value.

Having finished my observations of erysipelas and hospital gangrene in Louisville, I proceeded to Nashville, and placed myself in communication with Surgeon Thurston, U. S. V., Medical Director of hospitals in that city. With him I visited all of the principal hospitals, and among others the one appropriated to the reception of cases of erysipelas and hospital gangrene. I learned that the reports as to these diseases in Nashville had been much exaggerated. The whole number of cases of gangrene which had occurred since the battle of

Murfreesboro' has not exceeded twenty, and of these but six remained, all in progress of recovery.

The treatment followed in the Nashville hospitals consisted of applications of bromine, and the use of nitric acid in the ordinary manner. Dr. Thurston informed me that the latter treatment was preferred, and had, he thought, yielded the most successful results. It did not seem to me, however, that the bromine treatment, as practised in Nashville, was as thorough and effective as that pursued under the immediate supervision of Dr. Goldsmith.

*Erysipelas in Nashville.*—The number of cases of erysipelas following the battle of Murfreesboro' averaged about sixty until recently. At the time of visit that number had fallen to twenty, and all were tending towards recovery. All cases of disease were isolated on their first appearance in a hospital set apart for the purpose, under the charge of Assist. Surgeon Brown, U. S. A. This building was clean, well ventilated, and well managed. At the first outbreak of the affection several deaths had occurred in patients severely wounded.

I was informed by the Medical Director that at present the disease was tractable, and yielded readily to the therapeutic measures.

The treatment found most efficient, and which was almost universally adopted, was the local use of the bromine as already described; for constitutional remedies dependence was placed on iron, bark, tonics, full diet, &c.

Leaving Nashville, I proceeded to Murfreesboro'. The hospital gangrene, which at one time had been there rife and destructive, had almost disappeared; but few cases remained, and were convalescent.

The bromine treatment had been freely employed, but with varying results. I observed that its strongest advocates were those medical officers who had been previously stationed in Louisville, and who had been instructed in its use by Surgeon Goldsmith.

In conclusion, from a careful investigation of the cases in hospital at the time of my visit to the cities above mentioned, I would remark:—

1st. That the external employment of bromine in the treatment of hospital gangrene has been attended in Louisville with the most marked and beneficent results.

2d. That I have not observed that any injurious consequences whatever have resulted from its application, but the contrary.

3d. That all the medical officers with whom I have conversed in Louisville, Nashville, and Murfreesboro', unite in testimony as to the valuable therapeutic powers of bromine in the treatment of erysipelas; my own observation fully confirms their views.

4th. That as a disinfectant the use of bromine in hospital wards, and especially in hospitals intended for the reception of infectious disease, it is to be recommended, and is eminently deserving of further trial.

It will be observed that in the above report I have not alluded to the subject of pyæmia. In explanation I will state that I did not meet the disease in any of the hospitals I visited. I was informed that the pyæmic affection had not existed to any great extent; at all events, to an extent unduly proportioned to the number and gravity of the wounds following the Murfreesboro' battle. Full reports, however, of the affection, as it did prevail, are in process of preparation, and will be submitted to you when received.

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*Embolus of the Pulmonary Artery.* By S. Oakley Vanderpoel, M. D., of Albany, New York.—The study of *emboli* having of late years attracted the attention of pathologists, I have deemed the following notes of a case which has just passed under my observation, as illustrating still further the subject, would not be without interest. In the *American Journal of Medical Sciences* for April of this year, a case is reported, which, though originating from a traumatic cause, is ascribed to a condition of the system prominent in the one under consideration, viz., a lowered force of the heart, and perhaps contractility of the vessels.

I was called to attend Mrs. O—— on the 9th of April. She was about sixty years of age, and, while not corpulent, adipose tissue was full and well distributed. There were no constitutional symptoms or marked general disturbance,

but she complained of slight neuralgic pains alternating in different parts of the body; also, on attempting to rise, a sensation of great languor, and a feeling of lightness in the head. I noticed, while there was marked fairness and whiteness of the skin, there was no anæmia. I supposed it a case where nutrition was perverted; and though not decided fatty degeneration, still the molecular changes approximated that condition. Absolute rest was enjoined. She was directed to be raised only when necessary, and with care. A sustaining treatment, combined as necessary with morphine, was adopted. Improvement was gradual but marked. At my morning visit some three weeks since she complained of an unpleasant feeling in the left arm, as also that for an hour past it had been *cold;* she was obliged to keep it covered, and near a bottle of hot water.

On examination I found, while sensation was perfect, and motion no way impaired, save a feebleness in the limb, the circulation had so far ceased that no pulsation was perceptible in any part. This feeble vitality remained for over two hours, when the obstruction gave way suddenly, and circulation in all respects was as in the opposite limb. During the period of the obstruction I listened several times to determine whether any growths near the valves would, by floating off, cause the condition. Nothing abnormal could be detected.

Her general health improved so far that she rose easily from the bed, walked to the adjoining room, and sat up for some time. It was after a comfortable night, and, as she expressed it, "a more natural feeling than she had yet had," that she was seized with dyspnœa and prostration while walking into the adjacent room. I saw her very soon after: she was breathing very labouredly and rapidly; a dusky pallor was upon the surface; the heart was acting tumultuously, yet the capillary circulation was imperfect, and the extremities cold. Dr. Hun visited her in consultation during the afternoon, and suggested that the embolus was probably in the pulmonary artery. She lived about nineteen hours from the time of seizure.

*Post-mortem, twelve hours after death.*—The contents of the thoracic cavity (which was the only part examined) were removed entire. Upon opening the right ventricle of the heart a round, firm, fibrous band, about four lines in diameter, and some three inches in length, was found extending from the fleshy columns of the ventricle to the semilunar valves, and terminated in a bulb of black, coagulated blood, just within the pulmonary artery. Upon carefully dividing the branch of the pulmonary artery leading to the left lung, a fibrous deposit of quite firm consistence, about one inch in length, and of the diameter of the artery, was found just at the first branching of the artery within the lung, completely plugging the artery, and sending prolongations into the branches of the second size. The same condition was found upon dividing up the trunk leading to the right lung, save that the deposit on the left arterial trunk was *firmer* than the right.

The left ventricle contained a small amount of black coagulated blood; the right was *empty*. The muscular tissue of the heart was easily torn, and its outer surface covered with rather more than the usual layer of fat. The arteries showed no atheromatous deposit; the lungs were healthy, and, though not exsanguined, contained a less amount of blood than is usually found in the capillaries of the lung after death.

The microscopic appearance of the plug showed fibrillated fibrin, dense in structure, the meshes filled with hæmatine; some portions were evidently of more recent formation than others.—*American Med. Times,* June 20, 1863.

## UNIVERSITY OF PENNSYLVANIA.

At a Public Commencement, held March 14, 1863, in the Musical Fund Hall, the degree of DOCTOR OF MEDICINE was conferred by Rev. DANIEL R. GOODWIN, D. D., Provost, upon the following gentlemen; after which an Address was delivered by WM. PEPPER, M. D., Professor of the Theory and Practice of Medicine and Clinical Medicine.

| NAME. | TOWN OR P. O. | COUNTY. | STATE. | SUBJECT OF THESIS. |
|---|---|---|---|---|
| Atkinson, James T. | Amherst, | Cumberland, | Nova Sco. | Scarlet Fever. |
| Beers, A. M. | New Comerstown, | Tuscarawas, | Ohio, | Umbilical Hernia. |
| Bell, W. T. | Santa Fe, | Santa Fe, | New Mexico, | Yellow Fever. |
| Brinton, Wm. B. | West Chester, | Chester, | Pa. | Arterial Sedatives. |
| Byers, George | Selin's Grove, | Snyder, | Pa. | Pneumonia. |
| Carothers, A. E. | Newburg, | Cumberland, | Pa. | Compound Comminuted Fracture of the Femur. |
| Cheston, Elijah | Bristol, | Bucks, | Pa. | The Reliability of Pharmaceutical Preparations. |
| Cleaver, Israel | Reading, | Berks, | Pa. | Diarrhœa. |
| Corson, Ellwood M. | Plymouth Meeting, | Montgomery, | Pa. | Enteric Fever. |
| Corson, Joseph K. | Plymouth Meeting, | Montgomery, | Pa. | Extract of Indian Hemp. |
| Cottrell, Joseph F. | Columbia, | Lancaster, | Pa. | Diabetes. |
| Dale, Jared Y. | Boalsburg, | Centre, | Pa. | Pyæmia. |
| De Groff, Ephraim | Philadelphia, | | Pa. | Phthisis Pulmonalis. |
| Dickson, Jno. M. | Philadelphia, | | Pa. | Scarlatina. |
| Drake, Whitfield H. | Bethlehem, | Hunterdon, | N. J. | Opium. |
| Drennan, M. C. | Easton, | Northampton, | Pa. | Uterine Hemorrhage. |
| Eakin, A. Louis | Philadelphia, | | Pa. | Inflammation. |
| Engler, George S. | Easton, | Northampton, | Pa. | Cholera Morbus. |
| Enoch, Hiram D. | Washington, | Washington, | Pa. | Enteric Fever. |
| Everhart, I. F. | Blue Rock, | Chester, | Pa. | The Tripod of Life. |
| Fitch, C. Peckham | Philadelphia, | | Pa. | The Teeth; their Anatomical, Physiological, and Pathological Relations. |
| Fretz, A. N. | Boyerstown, | Berks, | Pa. | Tetanus. |
| Gittings, J. B. Howard | Upper Falls, | Baltimore, | Md. | Veratrum Viride. |
| Gray, Samuel G. | Columbia, | Lancaster, | Pa. | The Preparations of Mercury. |
| Grier, Matthew J. | Philadelphia, | | Pa. | Rheumatism. |
| Hagy, J. A. | Philadelphia, | | Pa. | Treatment of Fractures of the Femur. |
| Hamell, Benjamin F. | Camden, | Camden, | N. J. | Sequelæ of the Chickahominy Fever. |
| Hawks, J. Albert | Lambertsville, | Hunterdon, | N. J. | Enteric Fever. |
| Heritage, J. D. | Hurffville, | Camden, | N. J. | Chickahominy Diarrhœa. |
| Humphrey, Chas. E. | Cherryville, | Northampton, | Pa. | Circulation. |

| NAME. | TOWN OR P. O. | COUNTY. | STATE. | SUBJECT OF THESIS. |
|---|---|---|---|---|
| Inskeep, Edward W. | Media, | Delaware, | Pa. | Scarlatina. |
| James, H. H. | Budd's Lake, | Morris, | N. J. | Typhoid Fever. |
| Jones, Wm. H. | Easton, | Northampton, | Pa. | Dysentery. |
| Jordan, Alex. S. | Coopersburg, | Lehigh, | Pa. | Scarlatina. |
| Keffer, Fred. A. | Philadelphia, | | Pa. | Gunshot Wounds. |
| King, W. Howard | Philadelphia, | | Pa. | Variola. |
| Kreider, C. L. | Lebanon, | Lebanon, | Pa. | Constipation. |
| Le Moyne, Frank | Washington, | Washington, | Pa. | Gunshot Wounds. |
| Lees, John S. | Andora, | Philadelphia, | Pa. | Colica Pictonum. |
| Light, Samuel B. | Lebanon, | Lebanon, | Pa. | Pain. |
| Ludlow, R. G. | Nesharie, | Somerset, | N. J. | Acute Gastritis. |
| Martin, Wallace D. | Middletown, | Dauphin, | Pa. | Enteric Fever. |
| McAdam, A. H. | Philadelphia, | | Pa. | Phthisis. |
| McNeilly, Robert | Columbus, | Franklin, | Ohio, | The Relation of Mind to Disease. |
| Meily, S. S. | Lebanon, | Lebanon, | Pa. | Scarlatina. |
| Metcalf, Joseph N. | Garrettsburg, | Christian, | Ky. | Sleep and Death. |
| Middleton, H. P. | Washington, | | D. C. | Vesico-Vaginal Fistula. |
| Miller, Jacob F. | Easton, | Northampton, | Pa. | Leucorrhœa. |
| Milligan, H. W. | Philadelphia, | | Pa. | Causes of Deafness. |
| Myers, James S. | Philadelphia, | | Pa. | Gunshot Wounds of the Knee-Joint. |
| Norris, John C. | Washington, | | D. C. | Syphilis. |
| Peterson, Robert E. | Crosswick, | Burlington, | N. J. | Dysentery. |
| Pleibel, Fred. | Richmond, | Philadelphia, | Pa. | Arthritis. |
| Plunket, James D. | Nashville, | Davidson, | Tenn. | Acute Pneumonia. |
| Pomeroy, Geo. B. | Cincinnati, | Hamilton, | Ohio, | Cynanche Tonsillaris. |
| Pratt, Lynden M. | Groton Centre, | Middlesex, | Mass. | Gunshot Wounds. |
| Reber, Mayberry S. | Mohrsville, | Berks, | Pa. | Physical Diagnosis of the Respiratory Organs. |
| Reed, Samuel P. | Scranton, | Luzerne, | Pa. | Functional Diseases of the Liver. |
| Reeve, J. | Medford, | Burlington, | N. J. | Typhoid Pneumonia. |
| Rhoads, Edward | Philadelphia, | | Pa. | Therapeutics not Empiricism. |
| Richardson, Jno. P. | Norristown, | Montgomery, | Pa. | Enteric Fever. |
| Smith, S. D. | Newark, | New Castle, | Del. | Has the Type of Disease Changed? |
| Smith, George W. | Frankstown, | Blair, | Pa. | Eclampsia Gravidarum et Parturientium. |
| Stevenson, J. R. | Camden, | Camden, | N. J. | Typhoid Fever. |
| Storror, Edward | U. S. A. | | | Erysipelas. |
| Stretch, Charles C. | Allowaystown, | Salem, | N. J. | Hernia. |
| Strickland, D. Hayes | Hayesville, | Chester, | Pa. | Morbus Coxarius. |
| Swartzlander, Frank | Yardleyville, | Bucks, | Pa. | Diphtheria. |
| Trull, Washington B. | Boston, | Suffolk, | Mass. | Bilious Remittent Fever. |
| Tuller, Charles, Jr., | Philadelphia, | | Pa. | Dyspepsia. |
| Tyson, James | Reading, | Berks, | Pa. | Gunshot Wounds. |
| Uhler, A. S. | Schuylkill Falls, | Philadelphia, | Pa. | Pneumonia. |

| NAME. | TOWN OR P. O. | COUNTY. | STATE. | SUBJECT OF THESIS. |
|---|---|---|---|---|
| Ward, G. M. | Philadelphia, | | Pa. | Observations in Surgery during six weeks' residence in Convent, U. S. A. Hospital, Frederick City, Md. |
| Watson, R. Belville | Milton, | Northumberland, | Pa. | Signs of Pregnancy. |
| Webb, G. W. | Shepherdstown, | Jefferson, | Va. | Scarlatina; its Diagnosis and Treatment. |
| Welfley, D. P. | Salisbury, | Somerset, | Pa. | Diphtheria. |
| Wistar, Thomas | Philadelphia, | | Pa. | Hydrophobia. |
| Young, Oliver C. | Colebrookdale, | Berks, | Pa. | On Diversities of the Right and Left Sides of the Human Body. |

Total . . . . . . . 78

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## UNIVERSITY OF PENNSYLVANIA—PHILADELPHIA.

### MEDICAL DEPARTMENT.

### NINETY-EIGHTH SESSION, 1863–64.

| | |
|---|---|
| William Gibson, M. D., | Emeritus Professor of Surgery. |
| George B. Wood, M. D., | Emeritus Professor of Theory and Practice of Medicine. |
| Samuel Jackson, M. D., | Emeritus Professor of Institutes of Medicine. |
| Hugh L. Hodge, M. D., | Emeritus Professor of Obstetrics and the Diseases of Women and Children. |
| Joseph Carson, M. D., | Professor of Materia Medica and Pharmacy. |
| Robert E. Rogers, M. D., | Professor of Chemistry. |
| Joseph Leidy, M. D., | Professor of Anatomy. |
| Henry H. Smith, M. D., | Professor of Surgery. |
| William Pepper, M. D., | Professor of Theory and Practice of Medicine. |
| F. Gurney Smith, M. D., | Professor of Institutes of Medicine. |
| R. A. F. Penrose, M. D., | Professor of Obstetrics and the Diseases of Women and Children. |
| John H. Packard, M. D., | Demonstrator of Anatomy. |

The Lectures of the Session will begin on the second Monday of October and close on the first of March.

One Introductory will be delivered to the Course.

Clinical Instruction is given throughout the Session, in the Medical Hall, by the Professors, and at the Hospitals. At the Philadelphia Hospital, containing 571 beds, instruction is free.

Military Surgery and Hygiene will be fully taught by the appropriate chairs.

The Dissecting Rooms, under the superintendence of the Professor of Anatomy and the Demonstrator, are open from the middle of September.

The room for Operative Surgery and the Application of Bandages, &c., is open early in September and throughout the Session, under the supervision of the Professor of Surgery.

Surgical Demonstrators, . . . . { C. S. Bishop, M. D., H. Lenox Hodge, M. D.

| | |
|---|---|
| Fees for the Lectures (each Professor $15) . . . . . . | $105 |
| Matriculation Fee (paid once only) . . . . . . . . . | 5 |
| Graduation Fee . . . . . . . . . . . . . . . | 30 |

R. E. ROGERS, M. D., *Dean of the Medical Faculty, University Building.*

SAMUEL PRICE, *Janitor, University Building.*

P. S.—Board may be had at from $2 50 to $6 per week.

## JEFFERSON MEDICAL COLLEGE—SESSION 1863-64.

The Session will commence on Monday, the 12th of October, with a General Introductory Lecture by one of the Professors. The regular lectures will begin the day after. The Session will terminate on the last day of February. Great attention will be paid to instruction in the departments of Medicine and Surgery which have more intimate relations to military and naval service.

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Robert M. Huston, M. D., Emeritus Professor of Materia Medica and General Therapeutics.

Charles D. Meigs, M. D., Emeritus Professor of Obstetrics and Diseases of Women and Children.

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| | |
|---|---|
| Institutes of Medicine, . . . . . . | By Prof. Robley Dunglison, M. D. |
| General, Descriptive and Surgical Anatomy, . | " Joseph Pancoast, M. D. |
| Chemistry, . . . . . . . . . | " Franklin Bache, M. D. |
| Institutes and Practice of Surgery, . . | " Samuel D. Gross, M. D. |
| Materia Medica and General Therapeutics, . | " Thomas D. Mitchell, M.D. |
| Practice of Medicine, . . . . . . . | " S. Henry Dickson, M. D. |
| Obstetrics and Diseases of Women and Children, | " Ellerslie Wallace, M.D. |

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Clinics will be held regularly in September; and every Wednesday and Saturday in October, and during the course, Medical and Surgical cases will be investigated, prescribed for, and lectured on before the Class. During the year ending March the first, 1863, a large number of medical and surgical cases were treated, and numerous surgical operations performed; among them many of the most important. The lectures are so arranged as to permit the student to attend the clinics of the Pennsylvania Hospital, and the Philadelphia Hospital.

On and after the 1st of October, the dissecting-rooms will be open, under the direction of the Professor of Anatomy and the Demonstrator.

FEES.

| | |
|---|---|
| Matriculation, which is paid only once, . . . . . . . . | $ 5 |
| To each Member of the Faculty $15, . . . . . . . | 105 |
| Graduation, . . . . . . . . . . . . . . | 30 |

ROBLEY DUNGLISON, M. D.,
*Dean of the Faculty.*

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## UNIVERSITY OF NEW YORK.

### MEDICAL DEPARTMENT—SESSION 1863-4.

The Session for 1863-4 will begin on Monday, October 19, and will be continued until the 1st of March.

FACULTY OF MEDICINE.

Rev. Isaac Ferris, D. D., LL. D., *Chancellor of the University.*

Valentine Mott, M. D., LL. D., Emeritus Professor of Surgery and Surgical Anatomy, and Ex-President of the Faculty.

Martyn Paine, M. D., LL. D., Professor of Materia Medica and Therapeutics.

Gunning S. Bedford, M. D., Professor of Obstetrics, the Diseases of Women and Children, and Clinical Midwifery.

John W. Draper, M. D., LL. D., Professor of Chemistry and Physiology, President of the Faculty.

Alfred C. Post, M. D., Professor of the Principles and Operations of Surgery, with Military Surgery and Hygiene.

William H. Van Buren, M. D., Professor of General and Descriptive Anatomy.

John T. Metcalfe, M. D., Professor of the Institutes and Practice of Medicine.

Wm. R. Donaghe, M. D., Demonstrator of Anatomy.

Besides daily Lectures on the foregoing subjects, there will be five Cliniques, weekly, on *Medicine*, *Surgery*, and *Obstetrics*.

The Dissecting-Room, which is refitted and abundantly lighted with gas, is open from 8 o'clock A. M., to 10 o'clock P. M.

Fees for a full Course of Lectures, $105; Matriculation fee, $5; Graduation fee, $30; Demonstrator's fee, $5.

*** The usual *Spring*, *Summer*, and *Autumn* Course will begin on Monday, March 23, and be continued till the Winter Session commences. This Course is free to those who attend the Winter Session. Others pay $30.

# HARVARD UNIVERSITY.

## MASSACHUSETTS MEDICAL COLLEGE.

The annual course of Medical Lectures of Harvard University will commence at the Massachusetts Medical College, in North Grove Street, Boston, on the first Wednesday of November, 1863. The regular course will be as follows:—

| | | | |
|---|---|---|---|
| Obstetrics and Med. Jurisprudence, | by | Professor | D. HUMPHREYS STORER, M. D. |
| Morbid Anatomy, . . . . | " | " | JOHN B. S. JACKSON, M. D. |
| Clinical Medicine, . . . . | " | " | HENRY I. BOWDITCH, M. D. |
| Anatomy and Physiology, . . | " | " | OLIVER W. HOLMES, M. D. |
| Theory and Practice of Medicine, | " | " | GEORGE C. SHATTUCK, M. D. |
| Surgery, . . . . . . | " | " | HENRY J. BIGELOW, M. D. |
| Chemistry, . . . . . . | " | " | JOHN BACON, M. D. |
| Materia Medica . . . . | " | " | EDWARD H. CLARKE, M. D. |

Demonstrator, DAVID W. CHEEVER, M. D.

Clinical, Medical, and Surgical Instruction will be given at the Massachusetts General Hospital, with Surgical Operations.

Collateral special medical instruction will also be given at the Hospital by Lectures and otherwise, by Drs. BOWDITCH, ABBOT, and ELLIS.

Abundant material is afforded for the study of Practical Anatomy. The Room devoted to this department is open day and evening, and lighted by gas.

Fees for the Lectures, $85; Matriculation fee, $3; Graduation fee, $20.

Good Board can be obtained at $2 50 to $5 00 per week. Boarding places provided on application to the Janitor at the College.

Students are requested, upon coming to Boston, to call upon the Dean.

D. HUMPHREYS STORER, *Dean of the Faculty.*

July, 1863. *No.* 132 *Tremont Street, Boston.*

[July and Oct.]

# BELLEVUE HOSPITAL MEDICAL COLLEGE—CITY OF NEW YORK.

## SESSION FOR 1863-64.

THE Trustees and Faculty announce with much gratification the continued success of this Institution. The great advantages of combining thorough *didactic* and *clinical* teaching, by the union of a Medical College with Bellevue Hospital, have been practically exemplified during the two past years; and the Trustees and Faculty appeal with confidence to the medical students and practitioners who have attended the first and second sessions, in behalf of the successful practical working of the new plan of medical education inaugurated on an extensive scale by this College.

## FACULTY.

ISAAC E. TAYLOR, M. D., *President.*
AUSTIN FLINT, JR., M. D., *Secretary.*

JAMES R. WOOD, M. D., Professor of Operative Surgery and Surgical Pathology.
FRANK H. HAMILTON, M. D., Professor of Military Surgery, Fractures, and Dislocations.
LEWIS A. SAYRE, M. D., Professor of Orthopedic Surgery.
ALEXANDER B. MOTT, M. D., Professor of Surgical Anatomy.
STEPHEN SMITH, M. D., Professor of the Principles of Surgery.
ISAAC E. TAYLOR, M. D.,<br>GEORGE T. ELLIOT, M. D.,<br>B. FORDYCE BARKER, M. D., } Professors of Obstetrics and the Diseases of Women and Children.
BENJAMIN W. MCCREADY, M. D., Professor of Materia Medica and Therapeutics.
AUSTIN FLINT, M. D., Professor of the Principles and Practice of Medicine.
TIMOTHY CHILDS, M. D., Professor of Descriptive and Comparative Anatomy.

BELLEVUE HOSPITAL MEDICAL COLLEGE—Continued.

R. Ogden Doremus, M. D., Professor of Chemistry and Toxicology.
Henry D. Noyes, M. D., Demonstrator of Anatomy.

N. R. Moseley, M. D., Prosector to Chair of Surgical Anatomy.
Sylvester Teats, M. D., Prosector to Chair of Operative Surgery and Surgical Pathology.
A. W. Wilkinson, M. D., Assistant to Chair of Chemistry and Toxicology.
Arthur A. Shiverick, M. D., Assistant to Chair of the Principles and Practice of Medicine.

## PRELIMINARY TERM.

The preliminary term will commence on Wednesday, September 16, 1863, and continue to the beginning of the regular term, viz., four weeks. In addition to daily instruction in the Bellevue or Blackwell's Island Hospital during this term, didactic lectures on important practical subjects will be given daily, exclusively by members of the Faculty. Students are earnestly invited and advised (if practicable) to attend during the preliminary term, which is designed to be not merely a nominal, but an actual extension of the period of instruction.

## REGULAR TERM.

The regular term will commence on Wednesday October 14, 1863, and end early in March, 1864.

During the whole of the term the Student will have the opportunity of attending at least two clinical hospital lectures daily. The didactic lectures are arranged so as not to interfere, but alternate with attendance in the Hospital wards. Ample time is allowed for accompanying the visiting physicians, surgeons, and obstetricians in their daily rounds, attending clinical lectures, witnessing surgical and obstetrical operations, and following private courses, without compromising in any measure the regular didactic instruction. Clinical and Demonstrative teaching in all branches constituting the great feature of this College, the arrangements are such as to render the immense resources of the Hospitals available to the Student to the fullest extent.

All the lectures in this College are given either in the Hospitals or in the College building situated within the Bellevue Hospital grounds.

The Bellevue Hospital receives annually from *ten* to *twelve thousand patients.* The annual number of births in this Hospital is about *five hundred.* The Blackwell's Island Hospital contains usually about *one thousand* patients, including always several hundred cases of syphilis. In addition to the immense field of clinical instruction afforded by these Hospitals, and the various institutions under the management of the Commissioners of Public Charities and Correction, the Student may avail himself of other extensive resources for practical instruction contained in the great metropolis.

Practical Anatomy, amply provided for by law, may be prosecuted to any extent, and without expense

Twenty-two resident Physicians and Surgeons are annually appointed on the recommendation of the Medical Board of the Hospital, after an examination, and receive a salary adequate to their support.

Fees for all the tickets, preliminary and regular terms, $105. Tickets for any of the seven departments may be taken out separately. *Fees required in all cases.* Matriculation fee, $5. Graduation fee, $30. There are no fees for Hospital tickets, and no charges for anatomical material Students who have attended two full courses in other *accredited* schools receive all the tickets for $50. Students after two full courses in this College, or who have attended one full course in this College, and one full course previously in some other accredited school, are required to matriculate only.* Graduates of other schools, after three years, are required to matriculate only. Prior to the expiration of three years they receive a general ticket for $50.

The requirements for graduation are the same as in other Medical Colleges of the State of New York.

Board and lodging can be obtained for from $3 50 to $5 per week. The *necessary* expenses of a course of lectures in this College need not exceed $200.

For circulars or further information, address or apply to the Secretary of the Faculty, Austin Flint, Jr., M. D., Gramercy Park House; or to the Janitor, Mr. Edwin A Ware, at the entrance to Bellevue Hospital, 26th Street, between First Avenue and East River.

* Homœopathic and Eclectic Colleges, although legally incorporated, are not accredited.

THE

# AMERICAN JOURNAL

# OF THE MEDICAL SCIENCES

FOR OCTOBER 1863.

# CONTRIBUTORS TO THIS VOLUME.

D. H. AGNEW, M. D., *of Philadelphia.*
JOHN ASHHURST, Jr., M. D., *Acting Assistant Surgeon U. S. A.*
JOHN L. ATLEE, M. D., *of Lancaster, Pennsylvania.*
WALTER F. ATLEE, M. D., *Acting Assistant Surgeon U. S. A.*
A. S. BARE, M. D., *of Lancaster County, Pennsylvania.*
I. B. BELLANGER, M. D., *Acting Assistant Surgeon U. S. Army.*
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JAMES BLAKE, M. D., *of San Francisco, California.*
C. H. BOARDMAN, M. D., *of Philadelphia.*
ROBERT BRIDGES, M. D., *Professor of Chemistry in Philadelphia Coll. of Pharmacy.*
JOSEPH CARSON, M. D., *Professor of Materia Medica in the University of Penna.*
D. F. CONDIE, M. D., *of Philadelphia.*
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JAMES A. DRAPER, M. D., *Acting Assistant Surgeon U. S. A.*
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PLINY EARLE, M. D., *of Leicester, Mass.*
AUSTIN FLINT, M. D., *Professor of the Principles and Practice of Medicine in the Bellevue Hospital Medical College, and in the Long Island College Hospital.*
AUSTIN FLINT, Jr., M. D., *Professor of Physiology and Microscopy in Bellevue Hospital Medical College, and in the Long Island College Hospital.*
W. W. GERHARD, M. D., *of Philadelphia.*
C. R. GREENLEAF, M. D., *Assistant Surgeon U. S. A.*
HENRY HARTSHORNE, M. D., *of Philadelphia.*
ISAAC HAYS, M. D., *of Philadelphia.*
ADDINELL HEWSON, M. D., *one of the Surgeons to the Pennsylvania Hospital.*
G. R. B. HORNER, M. D., *Fleet Surgeon U. S. N.*
WILLIAM HUNT, M. D., *one of the Surgeons to Wills Hospital.*
J. P. HUTCHINSON, M. D., *of Philadelphia.*
WILSON JEWELL, M. D., *of Philadelphia.*
SAMUEL J. JONES, M. D., *Assistant Surgeon U. S. N.*
J. F. LAMB, M. D., *of Frankford, Pennsylvania.*
C. C. LEE, M. D., *Assistant Surgeon U. S. A.*
J. AITKEN MEIGS, M. D., *of Philadelphia.*
G. MOEHRING, M. D., *of Philadelphia.*
W. F. NORRIS, M. D., *Assistant Surgeon U. S. A.*
J. H. PACKARD, M. D., *Acting Assistant Surgeon U. S. A.*
J. C. PALMER, M. D., *Surgeon U. S. Navy.*
ARMISTEAD PETER, M. D., *Assistant Surgeon U. S. A.*
JAS. W. PITTINOS, M. D., *Assistant Surgeon U. S. V.*
DAVID PRINCE, M. D., *of Jacksonville, Illinois.*
I. F. SANFORD, M. D., *of Keokuk, Iowa.*
GEO. C. SHATTUCK, M. D., *Professor of the Theory and Practice of Physic in Massachusetts Medical College.*
A. H. SMITH, M. D., *of Philadelphia.*
ALFRED STILLÉ, M. D., *Acting Assistant Surgeon U. S. A.*
I. K. T. VAN PELT, M. D., *of Philadelphia.*
C. WAGNER, M. D., *Assist. Surg. U. S. A., Med. Director 2d Division 5th Army Corps.*
PHILIP S. WALES, M. D., *Surgeon U. S. N.*
J. MASON WARREN, M. D., *of Boston, Massachusetts.*
HORATIO C. WOOD, M. D., *Resident Physician of Pennsylvania Hospital.*

## *TO READERS AND CORRESPONDENTS.*

The reader is requested to make the following correction on p. 419, the 31st line from the top: the word magnesia should be changed to manganese.

The following works have been received:—

Transactions of the Obstetrical Society of London. Vol. IV. For the year 1862. London, 1863. (From the Society.)

On the Diseases, Injuries, and Malformations of the Rectum and Anus, with Remarks on Habitual Constipation. By T. J. ASHTON, F. R. M. C. C., &c. &c. Fourth edition. London: John Churchill, 1863. (From the Author.)

The Progress of Ophthalmic Surgery from the Invention of the Ophthalmoscope (in 1851) up to the present time. Being an Oration delivered before the North London Medical Society, on February 11, 1863. By JOHN ZACHARIAH LAWRENCE, F. R. C. S., Surgeon to the Surrey Ophthalmic Hospital. London. 1863. (From the Author.)

Researches on the Development of the Spinal Cord in Man, Mammalia, and Birds. By J. LOCKHART CLARKE, F.R.S. From the Philosophical Transactions. London, 1863. (From the Author.)

A Case of Rapid "Wasting Palsy" from Structural Disease of the Spinal Cord. By J. L. W. THUDICHUM, M. D., Lecturer on Chemistry.

The Investigation of the Nervous Centres, with Comments. By J. LOCKHART CLARKE, F.R.S., &c. From Dr. Beale's Archives of Medicine, No. XIII., 1863. (From J. Lockhart Clarke, F.R.S.)

Outlines of a New Theory of Muscular Action. By the Rev. SAMUEL HAUGHTON, M. D., F. R. S. F., Trinity College, Dublin. London and Dublin, 1863. (From the Author.)

The Principles and Practice of Ophthalmic Medicine and Surgery. By T. WHARTON JONES, F. R. S., Prof. Ophthalmic Med. and Surg. in Univ. College, London, &c. With 117 illustrations. Third and revised American edition. with additions, from the second London edition. Philadelphia: Blanchard & Lea, 1863. (From the Publishers.)

A Treatise on Hygiene, with Special Reference to the Military Service. By WM. A. HAMMOND, M. D., Surgeon-General U. S. A., F. R. C. P. P., &c. &c. &c. Philadelphia: J. B. Lippincott & Co., 1863. (From the Author.)

The Pharmacopœia of the United States of America. Fourth Decennial Revision. By authority of the National Convention for revising the Pharmacopœia, held at Washington, A. D. 1862. Philadelphia: J. B. Lippincott & Co., 1863.

Manual of Instructions for Military Surgeons, on the Examination of Recruits and Discharge of Soldiers: with an Appendix containing the Official Regulations of the Provost Marshal General's Bureau, and those for the Formation of the Invalid Corps, &c. &c. Prepared at the request of the United States Sanitary Commission. By John Ordronaux, M. D., Prof. Med. Jurisp. in Columbia College, N. Y. New York: D. Van Nostrand, 1863.

A Manual of Instructions for Enlisting and Discharging Soldiers: with special reference to the Medical Examination of Recruits, and the Detection of Disqualifying and Feigned Diseases. By Roberts Bartholow, A. M., M. D., Ass. Surg. U. S. A., &c. &c. &c. Adopted by the Surgeon-General for issue to Medical Officers of the Army. Philadelphia: J. B. Lippincott & Co., 1863. (From the Publishers.)

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The American Druggists' Circular and Chemical Gazette. July, August, September, 1863.

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# CONTENTS

OF THE

# AMERICAN JOURNAL

OF THE

# MEDICAL SCIENCES.

NO. XCII. NEW SERIES.

OCTOBER, 1863.

## ORIGINAL COMMUNICATIONS.

### MEMOIRS AND CASES.

## TRANSACTIONS OF SOCIETIES.



## REVIEWS.

## BIBLIOGRAPHICAL NOTICES.

---

# QUARTERLY SUMMARY

OF THE

# IMPROVEMENTS AND DISCOVERIES IN THE MEDICAL SCIENCES.

## FOREIGN INTELLIGENCE.

### Anatomy and Physiology.

### Materia Medica and Pharmacy.



### Medical Pathology and Therapeutics, and Practical Medicine.



### Surgical Pathology and Therapeutics, and Operative Surgery.



### Ophthalmology.



### Midwifery.

### Medical Jurisprudence and Toxicology.



---

## AMERICAN INTELLIGENCE.

### Original Communications.



### Domestic Summary.

THE

# AMERICAN JOURNAL

# OF THE MEDICAL SCIENCES

FOR OCTOBER 1863.

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## Art. I.—*On Operations for Cleft Palate.* By J. Mason Warren, M. D.

The operation of staphyloraphy is of comparatively modern invention. It was first attempted in Europe by Graefe (1817), and was first performed with success by Roux (1819), who seems not to have known of the unsuccessful attempt of the German professor. Shortly after, it was again performed by Dr. John C. Warren, of Boston, who not being aware of what had been done in Europe, himself invented new instruments for it. The operation was at first deemed applicable only to fissures of the soft palate, which, of course, are almost the exceptional cases, as out of from 80 to 100 operations for fissure of the palate which have fallen under my own observation, in not more than a tenth, probably, of the whole number was the fissure limited to the soft parts. Nearly all cases of fissure extending into the hard palate were rejected as unfit for operation, although Roux had suggested the idea of relaxing the soft palate by cutting it completely away from its attachments at the posterior edge of the palate bones. This operation is very likely to prove abortive, from the division of the vessels which supply the flaps with nourishment; and even if it succeeds, it leaves an unnecessarily large aperture in the bones, still to be covered by artificial means. Being impressed by the very great proportion of the cases of cleft palate which were deemed incurable, I was led to perform an operation for the especial relief of the more extensive fissures, which include both the soft and hard palate. An account of this operation (Uraniscoplasty) and its results was published in the *New England Quarterly Journal of Medicine and Surgery* for April, 1843, and also in this Journal for the same year. This operation consisted in dissecting, or rather peeling up the soft parts from the roof of the mouth, as far back in bad cases as the alveolar processes, and then cutting away

by the same section the muscular attachments of the soft palate to the palate bones, thus making a continuous flap of the tissues, from the alveolar arch in front to the extremity of the uvula behind. In addition to this, being very much impressed by the violent character of the muscular contractions, which always caused so much trouble in the performance of the operation in the soft palate, and has given rise to the exercise of so much ingenuity in the invention of instruments for bringing together the edges of the fissure and securing the knots, I was led to the idea of cutting away the organs which are active in producing these effects. In this stage of the operation, which is also described in my paper of 1843, I first divide, with a pair of powerful curved scissors, the posterior pillar of the palate, which is made up chiefly of the palato-pharyngens muscle. In case this does not effect a sufficient relaxation of the soft palate, by putting this organ on the stretch, the remaining muscles, which still confine by their action the sides of the fissure, will be felt in bold relief at the back part of the palate. This resisting mass is then divided by two or three cuts with the scissors, and immediately the half of the palate, which before the division was almost buried in the side of the throat, becomes flaccid and powerless. This section may be practised with advantage as well in cases where the fissure is simple as where it is complicated with fissure of the bones. In the latter case, if the fissure is very wide, it is often not advisable to attempt the dissection of the membrane from the whole hard palate, but it may be partially separated from its attachments to the bones at the back part of the fissure without disturbing it in front. By operating in this way, the edges of the soft palate can be easily approximated, and a plastic operation performed, "par glissement," which will in a measure also close the cleft in the bones. This, in fact, is the operation which I have chiefly practised of late years, from having found with what ease and efficiency an artificial plate can be adapted to cover the remaining small fissure of the bones, thus saving a very tedious and difficult part of the operation.

Some time after my first publication, Mr. Fergusson, the distinguished professor of surgery at King's College, London, published a paper upon Staphyloraphy in which he states that in addition to the division of the posterior pillar of the palate by means of the curved scissors, he also divides the levator palati muscle above the velum, using for the purpose a sharp-pointed curved knife passed through the fissure. This manœuvre confessedly involves some danger, in unskilful hands at least, of wounding the internal carotid artery,[1] and it complicates the operation by the unnecessary addition of a new instrument without effecting the division of the resisting muscles with any more thoroughness than had previously and has since been done in my operation with the scissors only.

Professor Langenbeck, of Berlin, has recently published a paper in

[1] See Fergusson's Practical Surgery, 3d edition, p. 612.

which he claims the invention of a new and important modification of the operation for fissure of the hard palate, from having insisted that the periosteum, as well as the mucous membrane, should be peeled off from the roof of the mouth. In my original paper I stated that "the mucous membrane of the hard palate is to be carefully separated from the bones with a long double-edged bistoury, curved on its flat side, and is rather peeled than dissected off, from the difficulty of making any sawing motion with the knife in this confined situation; the obstacles always being greater in proportion to the obliquity of the palatine vault." It will be seen from this description, that the only safety against the perforation of the flaps lies in keeping the knife close to the bone during the whole dissection, thus insuring the preservation, in connection with the flaps, of the greater part of the periosteum. Any one who will take the trouble to make a dissection of the hard palate may easily satisfy himself both that it is extremely difficult even in the dead subject, and still more so on the living, to split the soft tissues which cover it, and that it is also impossible to separate the whole periosteum cleanly from the rough and jagged protuberances which mark the oral surface of the palatine plate of the upper jaw.[1] It is therefore evident that the learned German professor has but accomplished the same results which I reported twenty years ago, and which have since been attained by many other surgeons, both in this country and in England.

The result of those operations may be stated briefly as follows. With the exception of perhaps half a dozen cases I have never failed to get more or less union of the soft palate. Sometimes one, or more rarely two, of the sutures have given way at the upper part where the tissues are put most fully on the stretch. If any of the stitches hold, however, and the smallest union takes place, it may be extended to any requisite degree by the application, at considerable intervals, of the solid nitrate of silver to the angle of the remaining fissure. The great point is to establish the arch of the soft palate, and after this is effected, artificial means can be used to cover up the remainder of the opening. Of course the more completely the fissure is closed by the operation, the better it is, but what I mean to say is that in the most extreme cases of very wide fissure, an operation can be performed which is as effectual in restoring the voice as in cases of fissure of the simplest character confined to the soft palate only. It is a curious fact that in one or two cases which I have seen of fissure extending but little further than through the uvula, the power of modulating the voice was as much impaired as in other cases where the fissure extended quite into the bones.

[1] See also papers upon this subject in the *Medical Times and Gazette* for January 18th, and February 8th, 1862. Also for structure of the coverings of the hard palate, see *Kölliker Gewebelehre des Menschen*, 3te Auflage, § 132, or the Sydenham Society's Translation, § 129.

The question is often asked of the surgeon whether the voice will be immediately restored by the operation, and if not, in what time the full restoration may be expected. The answer must, of course, be very indefinite; for in fact the patient has now to learn for the first time the art of using the palate in articulation. Almost every patient, after the opening is entirely closed, experiences a sense of relief, which is owing both to the greater ease with which deglutition is performed, and also to the protection afforded by the new palate to the mucous membrane of the posterior fauces, which, before the operation, was dry and parched from the constant passage of the air over it. Within the last few months I have had occasion to see several patients upon whom the operation was performed two or three years since. Two of them are teachers in public institutions, and the only defect to be perceived is a slight huskiness of the voice, which would hardly be noticed by any one ignorant of their former condition. I do not remember to have seen a case in which the patient was not benefited.

The hemorrhage which attends this operation is much less than might be expected from the very free incisions. These would at first sight seem likely to give rise to excessive bleeding, but I have never, even in the most vascular subjects, experienced any trouble: rinsing out the throat thoroughly with iced water is generally all that is needed. The same may be said in regard to the procedure necessary for the dissection of the mucous membrane from the hard palate. The time at which a vessel is apt to throw out a jet of blood is in cutting away the attachment of the reflected tendon of the tensor palati muscle where it joins the posterior margin of the palate bones, at which point some branches of one of the palatine arteries are generally divided. The bleeding, however, soon stops under the use of iced water, but, in one instance, where it continued after the sutures were adjusted, the upper stitch being very tense, and lifting the membrane up from the bone so as probably to prevent the retraction of the vessel, I was obliged to cut the stitch away, so as to allow the membrane to fall back upon the bone, when the bleeding at once ceased. In a case which I witnessed in the practice of another surgeon, the hemorrhage was quite abundant, and a solution of perchloride of iron was freely used both at the time of the operation and again when the bleeding returned some hours after. This application materially interfered with the union, although the case ultimately did well. I have never found it necessary, as has been recommended by some surgeons, to delay the adjustment of the sutures for any great length of time, in order to allow the bleeding to cease. A bit of ice held in the mouth after the edges are brought together has always been sufficient, with the single exception of the case here mentioned, in which it was necessary to cut away the upper stitch.

In the first few cases on which I operated, the patient was nourished by enemata for a few days immediately succeeding the operation. It was soon found, however, that abstinence from the use of liquids by the mouth was

followed by dryness and irritation of the fauces, which came near defeating the objects of the operation, and I was surprised to see how little danger there really is in permitting the patient the free use of liquid nourishment. In fact, the paralyzed condition of the muscles of the palate after their division prevents all danger of separation through their agency. After the first three or four days, an irritating cough is often brought on by the secretion of tough adhesive mucus in and around the wound. This cough is often so persistent as to threaten the destruction of the newly formed adhesions; it can sometimes be alleviated by the use of warm or acid drinks, or by brushing the surface of the wound gently with a weak solution of nitrate of silver.

At first I was disposed to begin to remove the sutures at the earliest possible period, but latterly, from having once had all the adhesions give way during the act of withdrawing them, I have allowed them to remain a very long time. It is rather important that the mouth should not be too widely opened during the early stages of the adhesive process; once, on the fifth or sixth day, I have known the entire wound to give way from the patient opening the mouth widely for the purpose of inspection.

I have tried one case of perfectly simple fissure in a child during the past year, without dividing the muscles. Everything looked fair after the operation, and it was the easiest and most promising case I have had for some years; the edges of the fissure came so easily together that I thought it unnecessary to add to the wound by the division of the muscles. The adhesions gave way about the seventh day, whether from the cause above stated, or from the child having taken solid food, or having committed some other imprudence, I am unable to say.

As to the proper age at which to operate—in one case of a fissure which extended but little more than through the uvula, I operated on a child of between six and seven years; but generally it is necessary to wait until the patient is old enough fully to appreciate the importance of the operation, and to submit patiently to pain and inconvenience, for this is one of the very few operations in which the use of anæsthetics is inadmissible. Under very peculiar circumstances, I suppose, ether might be administered, but not without some risk to the patient, and much embarrassment to the surgeon, from the constant flow of blood down the throat.

Of instruments especially designed for this operation, the forceps and "porte fil" are the most essential. The forceps, of which two pairs are required, are made with a double curve, adapted one to each side of the palate. They should have two teeth to each blade; the hinder blade, when the forceps are opened, being made to pass behind the palate, the construction of the instrument being such as to admit of the seizing of the extreme edge of the palate without taking a deeper hold upon its lower than on its upper surface. This, it will be seen, cannot be done by the common straight hooked forceps. The grasp should be sufficiently firm to control the palate

while the muscles are being divided, to which a very strong resistance is made. The strip of membrane upon the margin of the fissure can be removed without detaching the forceps from their first hold. The same process is repeated on the other side with the other pair of forceps. When this is finished, and the bleeding stopped by the use of a little iced water, the sutures are introduced. I have generally inserted the middle suture first, by that means controlling the palate, and thus rendering the insertion of the others easier. The lower one should be introduced last. The sutures used are single threads of surgeon's twist prepared by soaking, a day or two beforehand, according to a suggestion of my friend and former pupil Dr. Calvin G. Page, in the compound tincture of benzoin. By this means the silk acquires an adhesive property, which prevents its slipping when it is tied. In case the threads are not so prepared, they should be drawn partly through, wiped as dry as possible, and waxed at the point where the knot is to be tied. The thread should then be drawn suddenly back into the wound, brought together with a surgeon's knot, and this rapidly secured by a second one. In introducing the sutures I have found the needle of Schwerdt the most convenient instrument; the ligature is carried through the palate from behind forwards, the eye of the instrument is opened, the thread disengaged by means of a hook, and the needle withdrawn. At the lower part of the palate, where the parts are very movable, it is difficult to fix them with this instrument, and a simple curved needle held in a "porte aiguille" answers better. The chief objection to Schwerdt's "porte fil" is the difficulty of keeping it sharp, as the point being split, it is necessary to make it somewhat blunt to give it the requisite strength.

I have already stated that a heavy pair of French scissors curved on the flat side, is the instrument which I use for dividing the muscles. They should be made with great care, and the blades adjusted so as to cut perfectly true. For dissecting the soft parts from the hard palate, I use a spear-pointed knife with a short and broad blade curved on the flat side, the cutting part being about half an inch in length, the shank three inches long, the handle, large and roughened, four inches long. The membrane is partly cut and partly peeled off from the bones. It would at first seem probable that in this dissection of the tissues covering the hard palate, there would be danger of cutting off the palatine artery either where it emerges from the posterior palatine foramen or in its course along the roof of the mouth. I have not, however, met with this accident, and am inclined to believe that it is owing to the fact that the vessel is here protected by the groove sunk for it in the bone.

If the whole of the uvula is left, it is frequently brought in contact with the tongue in such a way as to produce cough and irritation of the throat; it also often becomes œdematous, and unites imperfectly. It is better, there-

fore, as a general rule, to remove the greater portion of it by the preliminary incisions.

I have to-day accidentally seen three cases of extreme fissure of both soft and hard palate. One, a woman of about thirty years of age, upon whom I operated about a year ago for a very wide fissure. Union of the soft palate was obtained to the extent of about an inch; the tension having been very great from the unusual deficiency of the soft parts. From a fear that her teeth were not sufficiently strong to afford a support to the plate, or from some other insufficient reason, she had deferred having an artificial plate introduced until the present time, and in fact was desirous that I should make the attempt to close the fissure in the bones, which was very wide, and had unusually shelving margins. This I told her I would attempt in case the aperture could not be covered in a satisfactory manner by artificial means. Dr. Rufus E. Dixon, who has made a great many such plates for patients upon whom I have operated, took a cast of the mouth and in about three days produced and fitted a plate to it. The effect was an immediate improvement in the speech, which became perfectly intelligible. In this case there are three facts deserving of notice. In the first place, the fissure extended through the lip, on the right side of the mouth, which is unusual, the arrest of development being almost always on the left side. The vomer was in this case continuous with the right palatine process of the maxillary bone. 2d. Before the operation, from some peculiar idea of her physician, the patient had starved herself for two or three weeks by way of preparation, probably with the idea of getting the stomach accustomed to the use of as little food as possible. 3d. From this reason, before the first incisions were completed, she became so faint as to make it difficult to proceed, and to render it necessary to administer stimulants; an ounce of brandy, or perhaps a little more, being given. The effect was, on an empty stomach unaccustomed to the use of spirits, that the operation was hardly resumed before she went into an apathetic state, from which it was almost impossible to arouse her, and it was only by the application of ammonia to the nostrils, cold to the head, and much energetic remonstrance, that she could be brought to a condition to admit of the completion of the operation. Soon after seeing this patient, a lady upon whom I had operated for a similar fissure two weeks since, came to me; the operation, so far as I had attempted it, having fully succeeded, and although the palate still remains somewhat red and tender, she is to go to-morrow to have a cast made, and will probably be able to wear the artificial plate in the course of the week. Shortly after this lady had left my house, a young man, twenty years of age, called on me, having been directed to do so by Dr. S. D. Townsend, who had very skilfully operated on his lip, many years ago, for a fissure attended with great separation of the bones. A very extensive dissection of the alæ of the nose and of the lip had been necessary to cover over the opening, and the

symmetry of the nose had been completely restored by the operation. The cleft in the alveolar arch was still very great, and there was also a wide fissure through the hard and soft palate. To remedy this deficiency, about a year since a very skilful dentist had made for him a gutta-percha palate, with two artificial teeth affixed to it, for the purpose of closing the gap in the alveolar arch. This covering extended quite back to the point in the fauces generally reached by the uvula; notwithstanding this his voice was wholly unintelligible, and he could not make me understand his name, until he wrote it. I mention this to show how essential the simple restoration of the arch of the palate is in articulation. In the present case I agreed to operate for this purpose in a few days.

A fourth case has also come under my notice within two days, as extreme as that last mentioned, and upon which I propose to operate shortly. The fissure extends through both the soft and hard palate, and the alveolar processes, and there is a wide hare-lip. This boy is 19 years old, and applied to me to have his lip operated on. As the large opening into the mouth afforded an uncommonly favourable opportunity for operating on the palate, I advised him strongly to have the latter operated on first, the idea of which had not before occurred to him.

Before terminating this paper, I would, in connection with it, make a few remarks on the operation for hare-lip, partly on account of its bearing on the operation for cleft palate, of which it is a very frequent complication. Dr. John Warren was an advocate of very early operation for this defect, and Dr. J. L. Peirson, of Salem, wrote a paper in which he urged the same thing strongly upon the profession. I have often done it at a very early age, and the result of my own experience is either to operate during the first twenty-four or forty-eight hours after birth, so that the child may be put to nurse as soon as the mother's milk is secreted, or else to defer the operation for a couple of weeks, until after the so-called icteric condition has passed, which frequently follows on the first few days after the birth of the child. In one instance in which I operated on a child, where the colour of the skin was so slight as not to attract my attention until after the operation, I at once perceived, on making the incisions, that the hemorrhage was greater than usual, proceeding, as it did, from the whole cut surface of the lip. The sutures were, however, introduced, and tied with great care, but in spite of styptic applications, the hemorrhage continued to such a degree as to endanger life, and it was found necessary at last to cut away the sutures, and to tie up piecemeal the whole margin of the fissure, leaving the opening much larger than before the operation. The wound did well, healing after the ligatures had come away. In this condition I left it, without any raw surface remaining, with the understanding that another operation could be performed at some future time. I did not see it again for five months, when, to my surprise, the child was shown to me without any appearance of a hare-lip. The parents said that contraction and coaptation of the

edges had commenced at the upper margin of the fissure, and had gradually extended until the entire opening had become obliterated. No scar appeared as after the usual operation, and the only indication that there had ever been a hare-lip was the slight looping up of the prolabium. When I first commenced practice, I adopted the French method of using sutures instead of pins, which had then been exclusively used in Boston, giving up bandages and sticking plaster as liable to cause irritation and to confine foul secretions, and I either made no application to the wound, or used merely a bit of linen or lint wet with water. I also introduced one stitch on the inner edge of the lip, cutting the ends of it very short. Finding that disordered digestion was of very frequent occurrence from giving up the natural method of nourishment by the breast and feeding the child with a spoon, even where the mother's milk itself was given, diarrhœa being brought on, and the process of repair interrupted and often destroyed by it, I was led to make the experiment of allowing the child to take the breast during the period of the cure, and I have had no cause to regret the trial. To my surprise I found that in the sucking process the edges of the fissure, instead of being drawn apart, as would naturally be expected, are, on the contrary, forced together in a way most favourable to their perfect coaptation.

BOSTON, May, 1863.

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ART. II.—*Delayed Union of Fractures, with Cases and Illustrations: the Successful Employment of Malgaigne's Spike in connection with Drilling in a case which had previously resisted drilling employed by itself.* By DAVID PRINCE, M. D., of Jacksonville, Illinois. Read before the Annual Meeting of the Illinois State Medical Society, held in Jacksonville, May, 1863. (With six wood-cuts.)

WHILE fractures sometimes unite under the most adverse circumstances, at other times union is delayed or does not take place where the appearances are at first most favourable. This difference of results, independent of external circumstances, can only be accounted for by the assumption of constitutional differences of aptitude to bony formation. While ossification will sometimes extend through an inch or two of plasma, reaching from one fragment to another, the separation to the extent of one-fourth of an inch will at other times prevent the bony union of the fragments. While privation and starvation sometimes fail to retard union, there is in some constitutions a necessity for a liberal diet to afford the necessary stimulus to bony deposit. The antiphlogistic remedies for high inflammation, if continued unnecessarily long, may sometimes prevent union, while in other

instances no practical amount of local or general reduction will interfere with bony formation. While, therefore, it is never safe to omit any of the conditions of success in the treatment of fractures, the greatest number of unfavourable circumstances may be insufficient to cause failure if the ossific tendency be strong.

It is suspected that a fuller investigation will show that separation of the fragments to a distance of one-fourth of an inch or more from each other, and insufficiently nutritious diet at the period of from three to five weeks from the date of injury, are the most frequent causes of delay or absence of union. If this shall be affirmed by experience, it follows that the two most important points for the surgeon to attend to are, the apposition of the broken surfaces of the fragments, and the proper nourishment of the patient during the ordinary period of ossification. It must not be forgotten, however, that the extreme of fulness in diet may beget conditions of the system more dangerous and unwelcome than protracted non-union.

The delay having occurred, and the fragments remaining beyond the usual period, connected by soft callus of a greater or less degree of firmness, the treatment will at once suggest itself to secure local stimulation by frictions upon the skin, movement of the broken surfaces upon each other, a resort to more liberal diet, securing a better general health by exercise or exposure in the open air, and pressure upon the parts with reference to the approximation of the fragments when this is practicable, and when the delay may be suspected to depend upon the motion of the fragments upon each other, the diminution or arrest of this motion.

All these failing, some means of inducing more active capillary circulation with congestion or inflammation must be resorted to.

1. In the list of means to this end, is the passing of a seton through the callus between the fragments. This may be supposed to excite inflammation in all the parts immediately surrounding the seton, including the neighbouring periosteum. As an important point of treatment is to get the action of ossification started somewhere, in order to favour the propagation of this action through the fibrinous material constituting the callus, the treatment is based upon intelligible physiological principles.

From the known tendency of long-continued inflammation in and near the periosteum, to induce bony deposit, it may be that Dr. Physick was right in retaining the seton a long time, with the result of a protracted congestion in the neighbouring bone and periosteum. It may be in practice better to try the seton first for the short period, and, if that fails, to try it for the long period where this method of treatment is pursued.

2. The injection of some stimulating agent like iodine into or around the callus is founded on correct principles, but must be so extremely uncertain that in the possession of surer means it is not worth any further trials.

3. Electricity or galvanism passed through acupuncture needles introduced into the substance between the fragments, or in close proximity to

them, can only be expected to succeed by exciting hyperæmia or inflammation.

4. Opening the parts, and scraping or sawing off the ends of the fragments, converts the case into one resembling compound fracture; but in very old cases, in which the false joint resembles a capsular ligament with its inclosed synovial membrane and cavity, this severe proceeding may be necessary. In any case in which the duration of the false joint is not measured by years, it is not easy to conceive this process to be necessary.

Dieffenbach's method of drilling and introducing ivory plugs, leaving them there to excite suppuration, can hardly be conceived better than the seton carried through the soft callus between the bones, while the risk of necrosis must be a strong objection to the proceeding.

6. Brainard's method of drilling through the solid bones and their intermediate soft callus, so practising the operation as to permit the skin to slide over the opening when the drill has been withdrawn, has two theoretic recommendations. First, a very great disturbance of the particular portions of the bone drilled is effected, giving rise to the production of new plastic material for the formation of callus in the track of the drill, without the occurrence of suppurative inflammation. Suppuration here, as in the healing of other tissues, must be supposed to retard the union, though the active capillary circulation in the vicinity of its seat may result in subsequent ossification. The case may be thus stated: If the bony deposit can be induced by congestion or non-suppurative inflammation, it is more speedy than that brought about by suppurative inflammation. Yet there may be cases in which a long-continued inflammation with suppuration will induce the formation of bone after the failure of a shorter course of inflammation without suppuration.

In the cases in which there can be success by congestion or non-suppurative inflammation, suppuration is an evil retarding the result. In the other cases it is a necessary attendant upon the prolonged inflammation.

Second. When the operation results in the effusion of plastic lymph without suppuration, there are new centres of ossification in the chips of bone cut off by the drill. These are left in the track of the drill; some of them in the soft callus between the ends of the fragments.

That these minute fragments of bone become parts of the living tissue which organizes around them is certain; for, if they did not, they would, by the offensive emanations of dead bone, excite suppuration and work their way to the exterior. The importance of these little fragments cut off by the drill, as centres of ossification, may have received too little attention. As in crystallization the introduction of a single minute crystal may be sufficient to start a process which is backward to commence without catalytic aid, so the process of ossification, when slow to begin, may be set in operation by a fragment of bone or periosteum imbedded in the plastic

material. To obtain this advantage of the bony fragments it is, of course, necessary that suppuration in the track of the drill should be avoided.

7. Applying metallic wires around the fragments to approximate them and prevent lateral motion, answers an obvious indication. To apply a wire around the fragments, it is, however, necessary to convert the fracture into the condition of a compound fracture, and afterwards, when union has taken place, the wire is to be left in, or removed at the expense of much disturbance of the parts. If a silver, gold, or platinum wire becomes covered with organized lymph or granulations it can do no harm, and may be allowed permanently to remain.

8. Perhaps a bone might be drilled through both fragments and held in apposition by a rivet of one of these metals. The presence of the rivet after the completion of the healing process would do no harm, and if a permanent discharge should be the result the metal could be readily removed.

9. Metallic points arranged for pressure on one or more of the fragments for the purpose of approximating them.

This expedient, where the nature of the parts makes it practicable, supplies an important indication. It accomplishes all that can be secured by the application of wires with more certainty, without extensively disturbing the soft parts, and the apparatus is easily tightened or loosened, increasing or diminishing the pressure, and is easily removed altogether.

Whether the separation of the fragments has been occasioned by the action of muscle or by the interposition of muscle or other material, the pressure will be constant, tending continually to approximate them.

Malgaigne's single spike for oblique fracture of the lower portion of the tibia is intended to prevent what it may afterwards be employed to remove, *i. e.*, a too wide separation of the fragments. In this apparatus the counter pressure is by means of a strap passing round the leg, including a splint, which distributes the pressure upon the back of the leg. In other cases the counter pressure must be by means of opposing points acting upon the opposed fragments, in order to bring them into close contact. Skill in making and adjusting the apparatus will be chiefly exercised in making it occupy sufficiently small space not to be in the way of placing the limb alternately in various positions while the process of union is going on.

Wherever the application of pressure by metallic points penetrating the soft parts and pressing the bony fragments together becomes necessary, it would have been important to apply them in the first place to bring the fragments into close contact and favour union by what is termed by Paget *immediate union*, or by *primary adhesion*.

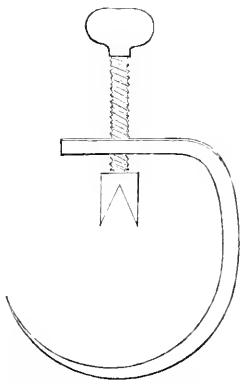
This is a new treatment, and the reason why it has not been adopted before this time is probably the repulsive appearance of the treatment to patients and friends. It is found by experience, however, that very little pain is occasioned by wearing for weeks a steel point applied with considerable force to the fragment to be held.

The treatment does not convert the fracture into the condition of a compound fracture, for the point can be applied at a sufficient distance from the place of fracture to avoid this complication. When, however, points have to be applied to opposite sides of the limb to act upon different fragments at the same time, they must be nearly or quite opposite each other; but as it is only in oblique fractures that the treatment is admissible, it will only in very rare cases be necessary to penetrate the interior wound in the soft parts.

In cases of compound fracture the points can be introduced into the wound or through the uninjured soft parts, as may be most convenient. This, as a first treatment of fracture, may be found to be less painful than apparently more comfortable modes of dressing, obviating the movement of one fragment upon the other by the closeness with which the surfaces are brought together. Some periosteal inflammation must be excited, which, if it extends to the fractured lines, can only the more certainly result in bony formation, whether as a primary treatment or as a method of curing non-union. A slight exfoliation of bone may occur at the spot where the metallic point is made to press; but this is a trifling consideration in comparison with an increased efficacy in the treatment.

A single point may be applied by means of the metallic yoke and strap, as employed by Malgaigne, and where two or more points are to be applied on opposite sides of the limb, an apparatus may be constructed resembling the clamp used by ladies to fasten to a table any fabric for greater convenience in sewing upon it, or like some forms of tourniquet made to apply opposing pads by means of a steel yoke approximated by some screw arrangement. The pads would for this purpose be replaced by points. The apparatus should be so arranged as to be capable of compressing the fragments as closely as may be necessary to keep them in apposition, and to hold them without any yielding whatever. There should be no elasticity in the retaining apparatus. (Fig. 1.)

Fig. 1.



Modification of Malgaigne's spike, employed for delayed union in oblique fractures.

If the pressure of the fragments upon each other is found to be painful to the patient, the screw may be loosened a very little, as a very small relaxation of pressure will be capable of affording relief.

CASE 1. *Non-Union of Tibia unsuccessfully treated by Drilling: afterwards successfully treated by Drilling followed by Compression of the Fragments by means of Malgaigne's Spike.*—Lt. Samuel L. Hamilton, Co. F, 19th Regt., Illinois Volunteers, on the 15th of May, 1862, had both fibula and tibia of the right leg broken a short distance above the

ankle by being thrown from a wagon, lighting upon his feet. He was treated in the army hospital, and the patient says his surgeons had considerable difficulty in keeping the bones in proper position.

After a few weeks a starch bandage was applied and the patient went upon crutches. The fibula united by bony material, but the tibia remained ununited. Some deformity existed from the action of the muscles, sliding the lower fragment upon the upper and bending the fibula, bringing the outside of the foot to the ground.

*Operation under Ether by Drilling, after Brainard's Method*, November 5th, 1863, five months and twenty days from the date of the injury :—

The fragments of the tibia were forcibly moved upon each other, and two holes were drilled through both fragments and the intermediate soft callus. The callus seemed from the jumping of the drill to be a quarter of an inch in thickness.

A side splint was applied, extending from the upper portion of the tibia over the malleolus, around which the limb was firmly bandaged. The fibula thus received the whole force of the bandage on one side, while upon the other side, the force of the bandage was received upon the malleolus, and the upper portion of the tibia by the intermedium of the splint. In two weeks the constant pressure had straightened the fibula so that there was no deformity. There was no perceptible motion between the fragments, and the splint was directed to be worn some time longer with the expectation of success.

This operation proved a failure, and the movement of the fragments upon each other became obvious enough.

*Second Operation: Drilling and the Application of Malgaigne's Spike*, March 11, 1863, ten months from the injury and four months from the previous operation :—

A very obvious deformity had been reproduced. The muscles acting upon the fibula as a fulcrum, had bent it so as to bring the outer side of the foot to the ground, while the inner side was slightly lifted from it. The patient having been brought under the influence of ether, the fibula was forcibly straightened by interstitial breaking, or by bending with breaking of portions of the substance; after which a quarter-inch drill was introduced between the fragments passing from below upward and backward, and freely rotated in the space between the two fragments breaking up the soft intervening callus. The fragments were thus shown to be one-quarter of an inch asunder. A small probe was introduced and left as the drill was withdrawn. Three holes were then drilled through the anterior fragment and intermediate callus and into the posterior or lower fragment.

The limb was then put upon a posterior splint which was a double inclined plane, and the steel-point of Malgaigne's spike placed about an inch above the lower end of the upper fragment through an incision made in the skin by a bistoury, the strap adjusted beneath the splint and the screw turned down until the probe left between the fragments was very firmly grasped by the approximation of the fragments. A light side splint was applied on each side within the yoke holding the spike. The probe was then pulled out from between the fragments.

With slight adjustments from time to time this apparatus was worn without removal twenty-eight days. The patient took opium enough during the first few days to quiet pain. He was overtaken with a chill to which he had for several months been subject, after which he had the consequent fever with a pulse of 120. He took quinia for this, and lager beer.

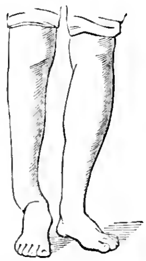
As soon as he was free from his ague he discontinued medicine. Considerable swelling and suppuration occurred around the spike which was not attended with much pain. The apparatus looked worse than it felt.

*April* 8. The twenty-eighth day removed the dressings and applied a tin side-splint.

17*th.* Applied a starch bandage, which was split on the 19th, and directed to be worn two weeks longer.

There is a node on the inner side of the tibia exactly opposite the point occupied by the spike as if periosteal inflammation had extended around the limb from the point of irritation by the spike. A few minute exfoliations afterwards came out in the vicinity of the point pressed upon by the spike. Consolidation followed this treatment, gradually imparting confidence to the patient who cautiously ventured to walk upon the limb. The patient left to rejoin the army the first of July.

Fig. 2.



Appearance of leg of Lieut. Hamilton, March 10, 1863.

Fig. 3.

Appearance of leg of Lieut. Hamilton, June 27, 1863.

(Engraved from photographs.)

CASE 2. *Ununited Fracture of Tibia and Fibula of three years' Duration, with much Angular Deformity from Contraction of Muscles. Reduction of Deformity by Extension and Lateral Pressure—Drilling the Bones according to Brainard's Method, resulting in Bony Union without Deformity or Lameness.*—Augustus Simpkins, of Pike County, Illinois, aged about thirty-five, had a simple transverse fracture of the middle portion of the tibia and fibula of the right leg, by the fall of a tree.

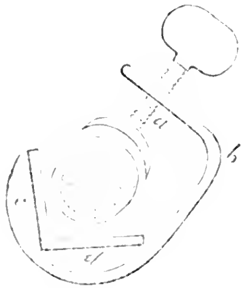
There is said to have been much swelling and inflammation, and the skin was cut to let out the effused fluids. Cold applications were kept upon the leg, and the patient restricted to a low diet. No union by bone followed, and the angular deformity—the foot being carried out, making the leg look like a limb with a knock-knee—resulted gradually from muscular contraction. When the patient stands erect the toes only come to the ground, the lower portion of the leg being at an angle of 45° with the upper.

*June* 12, 1861. The non-union has been of three years' duration.

Applied the most powerful extension practicable by the lever arrangement of Jarvis' adjuster attached to the distal end of a long splint, the counter-extension being upon the ischium and groin, while lateral pressure was applied by a sort of tourniquet working with a strong screw.

Forcible working of the ends of the bones upon each other was practised by taking hold of the limb with the hands, and the tendo-Achillis was divided. With all this the limb was not restored to its straight position, and the apparatus breaking under the great strain applied, the process was

Fig. 4.




*a.* Screw with its concave pad applied to the projecting angle of the leg. *b.* Hook for retaining the screw, making counter-pressure upon the splints. *c.* Long splint, which is the medium of extension. *d.* Back splint attached to the long splint for aiding in securing the counter-lateral pressure.

stopped. The limb was dressed so as to retain as far as possible what had been gained.

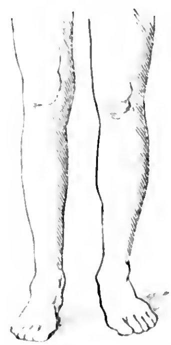
After five days, not much inflammatory excitement had appeared, and the limb was subjected to another process. The bones were drilled from one fragment into the other in six places, taking different directions, all traversing the soft callus between the ends of the bones. The extension and lateral pressure were applied as in the first instance, only with stronger apparatus. The extension was from the ankle by means of a roller applied around it to hold the loops. The limb was not only straightened by this operation, but the muscular resistance was so completely overcome, that I bent the limb in the opposite direction without difficulty. The thigh, leg, and foot were then placed in a side splint, made of tin, and kept in it until the consolidation was complete, except when taken out for washing and friction to the skin.

In three weeks from the first operation he went home, a distance of forty miles, riding about half the distance in a buggy. The splint was worn about ten weeks. Perhaps it might have been laid aside sooner, but the patient, after his three years' experience, was afraid to trust his limb too soon.

During the operation a mixture of ether and chloroform was inhaled, and, to quiet the subsequent pain, morphia was freely administered. No other antiphlogistic treatment was resorted to than cathartics.

Fig. 5.

Fig. 6.



The above figures, engraved from photographs, represent the appearances of the limb, before treatment, Fig. 5; after treatment, Fig. 6.

The result in this case should lead us never to despair of success until after trials of means of cure. As the fracture of the tibia was transverse

the interposed substance was subjected to great pressure by the contraction of the muscles, and there was no want of apposition to account for the non-union. It is suspected that the antiphlogistic treatment was too long continued. The fragments of the fibula became overlapped as the limb assumed the angular position, but when brought into proper relations by straightening the limb the fragments became united by bony substance.

The preceding figures (Figs. 5 and 6) represent the conditions before and after treatment.

CASE 3. *Drilling the Callus only, unsuccessful: Bony Union afterwards induced by walking.*—In one case of simple oblique fracture of the upper portion of the lower third of the tibia and fibula by the falling of a tree, originally treated by me with great care by extension to avoid shortening or other deformity, the ossific union was delayed beyond the usual time. The callus was broken up by the insertion of a drill between the fragments of bone, but the hard bone was not drilled. This means failed up to the time when the patient, becoming impatient, placed himself in charge of another practitioner, who removed the splint and set the patient to exercising, bearing what weight he could upon the broken limb, after which bony union occurred with considerable deformity, the angle projecting forward.

CASE 4. *Drilling the Callus only: its influence doubtful, but the case successful.*—In another case of oblique simple fracture of the tibia with fracture of the fibula, ossific union was delayed beyond the usual length of time.

A drill was inserted between the fragments, and the diet made more liberal, after which union occurred without deformity.

The patient attributed the delay of union to the cutting off of his daily drinks of whiskey, and perhaps he was right. As the accident occurred while he was drunk, it seemed a good time to reform, but the moral the patient drew from the delay of union was unfavourable to reformation.

I am led to think that the perforation of the callus by awls or drills, which do not penetrate the bony substance, is useless, and perhaps worse than useless, by breaking up its organization without influencing the bone and periosteum, whence the process of bone formation most readily proceeds.

CASE 5. *Drilling the Bone.*—Thomas Mulready, an Irishman of short stature, aged about thirty, had an oblique fracture of the lower third of the tibia, beginning two and a half inches above the joint and extending upwards and backwards with fracture of fibula.

I first saw the case three months after the injury, when there was forward projection of the upper fragment of the tibia, with a shortening of an inch and three-quarters. The fibula had united.

Four holes were drilled through both fragments and the intermediate soft callus. Side splints made of cloth, saturated with an alcoholic solution of shellac, were applied and worn twenty-two days from the date of the perforation, when the fragments were found to have become consolidated. During a part of this time the patient was pretty well stimulated with whiskey and quinine.

The recovery was complete and permanent.

CASES 6 & 7. *Seton successful in two Cases.*—In 1848 I treated a case of non-union of the tibia successfully with the seton, and in 1851 a case of non-union of the humerus. In both these cases the seton was withdrawn at the end of two weeks, when the inflammatory action was supposed to be at its height. The success in both these cases was all that could be desired.

*Summary. Seven Cases treated—two by Seton successful.*—It is probable that the result is owing to increased vascular activity in the hard bone and periosteum, and not owing to any action set up in the callus itself.

Two by perforation of callus. This treatment is believed to be useless. The patients recovered, one from a resumption of his customary alcoholic stimulus, and the other from the stimulus of walking.

Three by drilling through the hard bone of both fragments. Two of these cases were successful on first trial; the other was unsuccessful at first, but afterwards successful when combined with compression by means of the metallic point impinging upon the projecting fragment.

Of the seven cases, all ultimately recovered; the two in which the callus was simply perforated would probably have done as well without the perforation.

Six of the cases were of the leg, and in all of them both bones were originally broken.

In four of the six cases the fibula united while the tibia remained ununited. In two cases the fibula remained ununited until the tibia finally united, but united at length without any treatment applied directly to the fibula itself. From this it appears that the fibula is more prone to unite than the tibia. Perhaps this is because the fracture is more likely to be transverse, on which account it is less subject to displacement, and because the tendinous and muscular investments hold the two fragments of the fibula together instead of tending to separate them, as is the case in oblique fractures of the middle and lower portions of the tibia.

One case of the middle portion of the humerus. The seven cases all ultimately successful.

NOTE.—June 30, 1863. I have now a case of oblique fracture at the junction of the middle and lower third of the tibia, extending from below and before upward and backward with fracture of the fibula—the fibula united, the tibia ununited—though the injury occurred twelve weeks since.

Four holes drilled transversely to the line of the fracture. The result remains to be seen.

Art. III.—*Cases showing the Influence of Living in the Open Air in the Treatment of Phthisis.* By James Blake, M. D., Lond., F. R. C. S., of San Francisco, California.

The following cases are published as furnishing some evidence of the influence of what may be termed the out-of-door plan of treating phthisis. They are not numerous, but as they include all the cases that have been submitted to the treatment in regard to which I have any certain data, they show a result which has never been obtained from any other plan of treating the disease. The treatment I have pursued has been to direct my patient to live entirely in the open air during the summer months, at an elevation of from three to five thousand feet above the sea, in our coast range of mountains, where the temperature is very equable, and no rain falls for five or six months. They are directed not even to sleep in tents, but out under the trees. Their diet was plain camp fare, sufficient game being found in the mountains to keep the camp supplied. Unfortunately, in no instance have I been enabled fully to carry out the plan of treatment, as the social position of my patients was such that they would only avail themselves of the facilities offered by our summer climate for living in the open air. Had they been able to pass the winter in Northern Mexico, where the winters are rainless and the winter climate in the mountains exactly the same as that of our coast range during the summer, I have no doubt that in every instance the disease would have been much more rapidly cured.

I shall now briefly relate the history of four cases which have been submitted to this out-of-door plan of treatment during the summer months, and of three others in which it has been carried out in a modified form. During the winter all the patients have lived in rather unfavourable hygienic conditions, as the cold damp fogs that occasionally prevail in the valley of the Sacramento at that season are prejudicial to phthisical subjects. In relating these cases, I shall allude more particularly to the gain in weight, as showing the influence of treatment on the progress of the disease. This is a symptom more evident and tangible than any other, and, as Dr. Cotton observes, "it seems to be a general rule that an increase of weight as the effect of treatment both proclaims its success and measures its extent. (*Cotton on Consumption*, 2d ed., p. 133.)

Case 1. Mr. D——, æt. 36, bilious temperament, spare habit, consulted me in August, 1858. Had been coughing for some months, latterly hæmoptysis, but not to any great extent. Had lost twelve pounds in weight; pulse 98. Softened tubercles in right lung dull to nipple. As there still remained some weeks of summer weather, I advised him to go to the mountains and remain camped out as long as possible. The cough being troublesome, I ordered a mixture with nitromuriatic acid, creasote, and a small quantity of morphia. He had been taking cod-liver oil for

some months, which he was to continue. He remained out until the end of October, at which time he had gained seven pounds in weight. The cough was much improved; expectoration less. I did not see him until January, 1859. Dulness on percussion about the same; general strength improved; pulse 90. With careful hygienic treatment the disease advanced but little until March, when, from moving into a damp house, he had a violent attack of pneumonia, principally in the left lung, with a slighter attack in the right. This kept him in bed for three weeks, and it was a month longer before he could go out. After the acute disease had subsided, he was left with a cavity in the right lung and softening of the upper part of the left, dulness extending as low as the fourth rib. He left for the mountains in the month of May, having lost in weight during the winter about seven pounds, making his weight one hundred and forty-four pounds. He returned home in the month of September, having improved in strength, and having gained seven pounds in weight. He left the mountains sooner than I had advised, for, as he lived in a very malarious district, the valley of the Upper Sacramento, I was afraid he would have intermittent, which in fact he took. I did not see him again until the spring of 1860, when I found that the disease in the right lung was apparently quiescent, for, although a cavity still was there, there were no moist sounds. In the left lung the disease had progressed, as there was a cavity under the second rib, and two or three times during the winter it had been the seat of intercurrent inflammation. The pulse was 102, and, on the whole, I considered him in a worse condition than when I had last seen him. During the winter he had lost nine pounds in weight. The following summer was passed in the mountains, with a gain of seven pounds in weight. During the winter of 1860–61 he lost seven pounds, and the following summer he gained four pounds. In the winter of 1861–62 the loss in weight was six pounds, and during the last summer he gained eleven pounds, or more than he had gained during any previous summer. I have not seen Mr. D—— since the spring of 1860, but at my request he has observed the above facts in relation to his case, and as he is a good observer, and not at all over-sanguine, every confidence can be placed in his statements.

In November, 1862, when furnishing me with the above figures as to his weight, he observes: "I still cough some in the morning, which is attended with slight expectoration. I believe my general health is better in comparison than my increased weight would indicate. I have placed much reliance in your advice as to the general course I should pursue, and now, after four years devoted to the restoration of my health in the manner you indicated, it is but just to say that my present state warrants stronger hopes of final recovery than it has at any previous time since I first consulted you."

Case 2. Mr. J——, æt. 38. Saw him in March, 1860. He had then been confined to his bed some weeks by a violent attack of hæmoptysis, followed by pneumonia. Before this, he had been coughing and losing flesh for some months. The right lung was found to be extensively diseased, fully one-half of the lung being dull, and softening tubercles as low down as the fourth rib. The upper part of the left lung well-marked roughened expiration. By the end of May he had recovered sufficient strength to ride in a carriage, and I sent him out in the mountains. He returned towards the end of September, having gained fourteen pounds in weight. The cough had almost disappeared, and there was not more than

a teaspoonful of expectoration in twenty-four hours. There was a dry cavity found under the fourth rib of the right side, but no moist sounds were heard except just below the clavicle. The roughness of expiration had entirely disappeared from the left lung. The strength had improved in proportion to the gain in weight, as on the last days of the journey home Mr. J—— rode forty-three miles on horseback without over-fatigue. He had returned some weeks sooner than I had advised, and had an attack of intermittent fever. For this he took a trip up into the Sierra range, where he was caught in a snow storm and confined in a house for some days in very unfavourable hygienic conditions. During the winter the disease made some progress, and he lost ten pounds in weight. In the spring he went out into the coast range, and returned after two months, having gained five pounds in weight. He then went across the plains to the Eastern States, and I believe he died in the following June.

CASE 3. Mr. W——, æt. 36, has been troubled with cough resulting from laryngeal disease for some years. In the fall of 1860 well-marked signs of tubercular deposit were found in the upper part of the left lung. During the winter the disease progressed, notwithstanding careful hygienic and medicinal treatment. In May, 1861, softening of the tubercles had taken place to a considerable extent, and the patient had lost about fifteen pounds in weight. The summer of 1861 was passed in the coast range of mountains, living entirely in the open air. In November the patient returned, having gained ten pounds in weight, and although there was still considerable cough from the laryngeal affection, yet the expectoration had nearly ceased, and no moist sounds were heard in the lung. The area of dulness had very much decreased, and rough slightly-blowing respiration was heard where muco-crepitant sounds had been noticed. The winter of 1861–62 was a very severe one in this State, and was passed by Mr. W—— in very unfavourable hygienic conditions. The disease progressed, and there was a loss of weight of seven pounds. I have not seen the patient since March, 1862, but I understand the disease is progressing, although I cannot obtain any correct data as to his present condition.

CASE 4. Mr. R——, æt. 37. Was not a patient of mine, but spent the summer of 1862 in the mountains with the last patient, Mr. W——. I have no doubt but that he was suffering from phthisis in the third stage, as I had daily opportunities of seeing him, and his chest had been examined by one of our best physicians, who pronounced the case to be phthisis. He had been coughing for more than a year, had lost forty pounds in weight, and was so reduced in strength that when he started to go to the mountains he could not go up a flight of stairs without stopping once or twice to recover his breath. After passing the summer in the mountains, he had gained by October nineteen pounds in weight, the cough had almost gone, and there was but little expectoration. Since this time he has been following his profession, that of a lawyer, but under most favourable hygienic conditions, as his residence is in one of the valleys of the coast range, and he takes a great deal of out-of-door exercise, and lives most rationally. In November, 1862, he wrote me: "My health has gradually improved since my return, and I attribute it entirely to out-of-door exercise and other hygienic means. I weigh now, after a hot summer, one hundred and fifty pounds" (his weight when he went out was one hundred and thirty-six, and when he returned one hundred and fifty-five pounds) "and shall probably increase to one hundred and sixty-five pounds during the winter."

I saw Mr. R—— on the 4th of January, 1863. He informed me that he had gained eight pounds in weight since he wrote me, that he only coughed a little morning and evening, and that he could walk up hill without difficulty. His pulse then (5 P. M.) was 82.

The following table exhibits the gain in weight in these four cases during the time they lived in the open air on the mountains:—

Case 1.—Health weight, 156 pounds.

| | | |
|---|---|---|
| | Softened tubercles in one lung. | |
| 1858. Aug. 144 lbs. | Nov. 151 lbs. | Increase, 7 lbs. |
| | Cavity in one lung, tubercles in the other. | |
| 1859. April, 142 lbs. | Nov. 151 lbs. | Increase, 9 lbs. |
| | Cavity in each lung. | |
| 1860. April, 142 lbs. | Nov. 149 lbs. | Increase, 7 lbs. |
| 1861. April, 142 " | Nov. 146 " | " 4 " |
| 1862. April, 140 " | Nov. 151 " | " 11 " |

Case 2.—Health weight, 144 pounds.

| | | |
|---|---|---|
| | Cavity in one lung. | |
| 1860. April, 119 lbs. | Nov. 133 lbs. | Increase, 14 lbs. |
| 1861. April, 123 " | July, 128 " | " 5 " |

Case 3.—Health weight, 138 pounds.

| | | |
|---|---|---|
| | Softened tubercles in one lung. | |
| 1861. April, 121 lbs. | Nov. 131 lbs. | Increase, 10 lbs. |

Case 4.—Health weight, 176 pounds.

| | | |
|---|---|---|
| | Cavity in one lung. | |
| 1861. April, 136 lbs. | Nov. 155 lbs. | Increase, 19 lbs. |
| | Following his profession. | |
| 1863. | Jan. 158 lbs. | Increase, 3 lbs. |

I will now relate the history of three cases in which the open air treatment was only partially carried out, but in which rapid improvement took place. These, however, are selected cases, or, unfortunately, rather cases which have been treated with the best hygienic and medical means, but in which a mountain residence in the open air could not be had, have gradually gone on to a fatal termination.

Case 5. Mr. C., æt. 32, sanguineous temperament, consulted me in January, 1856. Had been coughing for some months, and had lost thirty-three pounds in weight. Left lung extensively diseased; muco-crepitant râle heard as low as fifth rib, and strong indications of a cavity under the clavicle. The sputa contained a great deal of softened tubercle; cough very troublesome; pulse 98. I advised a trip to the Sandwich Islands to pass the remainder of the winter, prescribing cod-liver oil, iron and morphia, good diet and bitter ale. (The patient before had been on low diet and expectorants.) Rapid improvement took place during the voyage out and home; weight when he started one hundred and fourteen pounds; at the end of April on his return, one hundred and forty-seven. The cough was very much less. Unfortunately, I had no opportunity of examining the lungs. The next summer was passed in the mountains, at an elevation of about twenty-five hundred feet. I have not had an opportunity of seeing him since, but in December, 1862, he writes me: "I have hardly been troubled with cough since my return from the islands. I am enjoying good health, and at the present time weigh one hundred and fifty-two

pounds." Hygienic rules are carefully observed by him, and as his residence is at an elevation of about twenty-five hundred feet, he has not been subjected to any malarious causes of disease.

CASE 6. Mr. A., æt. 29, large framed, hemo-phlegmatic temperament, consulted me in October, 1856. Subject to a cough for some winters, and strong family predisposition to the disease. Last summer, his health deteriorated from working in mines, where, according to his account, the air must have been extremely foul. About six weeks before I saw him he took cold, and must have had an attack of subacute pneumonia. Has been coughing and expectorating a great deal more ever since; has lost upwards of thirty pounds in weight during the last six months. Extensive dulness and moist rattles in right lung; left lung sound; pulse 102; tongue flabby and coated. As he had to gain his living, I advised him to shoot game for the market, as thus he could pass the most of his time in the open air. Having been used to exposure, he was told to sleep in an open shed, except in stormy weather, and as the winter was a fine one, there were but few days in which he could not live almost out of doors. In the way of medical treatment, he was ordered an emetic of sulphate of zinc and ipecac. every third day;[1] bitter infusions to restore the tone of his stomach, and cod-liver oil and iron when his stomach would bear it. Under this treatment he improved rapidly, so that at the end of four months he had gained twenty-two pounds in weight, and was coughing but very little. Against my advice, he returned to his quartz leads in the spring, and on the following winter, the disease progressing, he placed himself under the care of a hydropathist, and after being packed in wet sheets for three months, he was carefully enveloped in one that was dry, before being taken to the cemetery.

CASE 7. J. M. D., æt. 36, consulted me in November, 1859; has had a cough, and been losing flesh for the last twelve months, having lost fourteen pounds in weight. Muco-purulent expectoration; has had no hæmoptysis. On examining the chest I found movements of right side much restricted, and moist râles on that side as low as third rib; roughened expiratory sound on upper part of left lung; cough troublesome at night; pulse 96, 3 P. M. Although it was in November, I hoped a careful hygienic treatment might enable him to keep up until the spring without change of climate, and accordingly I put him on wholesome diet, as much out-of-door exercise on horseback as he could stand, and well-ventilated rooms. He took tinct. ferri, small doses of morphia and cod-liver oil. During the winter he improved slightly, having gained by the end of February two pounds in weight and considerable strength; there was less cough and expectoration, but no appreciable difference in the stethoscopic signs. Early in March he left the city to superintend the construction of a road across the Sierra, and was exposed during the two following months to some very rough weather in the shape of snow and rain storms, at an elevation of four or five thousand feet, and with very imperfect shelter. From the time he left the valley, his health began rapidly to improve. During the whole of the summer, he was camping out with the party constructing the telegraph from here to Salt Lake, and by the autumn had entirely lost his

[1] When clinical clerk to the late Dr. Anthony Todd Thompson, at University College Hospital, emetics in phthisis were quite the fashion, and I certainly have seen benefit derived from them, probably, however, only in cases in which they were useful in improving the digestive organs.

cough; had gained sixteen pounds in weight, and considered himself quite well. Since then he has led an active life, having been a great part of the time in the mountains and on the plains beyond the Sierra (the elevation of the plains is from four to five thousand feet). He enjoys perfect health, having had no cough during the two last winters, and his weight is some pounds greater than it was before he was taken sick.

Such are the facts which I have to bring forward as showing what can be effected in cases of phthisis by the out-of-door treatment of the disease. Case 1 was a bad one, and must probably have terminated fatally in the spring or summer of '61, had it not been for the treatment pursued. Even at the present time the patient is not well, but the greater increase in weight during the last summer, as compared with the gain during any previous summer, gives room to hope that the patient is outgrowing the tendency to the disease, and that perfect recovery will be the result. Case No. 4, when submitted to treatment, was an extremely unpromising one, but it now bids fair to be eventually cured. There is at present but slight cough in the morning; no difficulty in ascending hills, and there has been a steady increase in weight even during the present winter. In Case 3, the issue is doubtful; besides the pulmonary disease, this patient has been troubled for some years with an affection of the larynx, which keeps up a constant cough. The gain of ten pounds in weight by a person whose health weight is only one hundred and thirty-six pounds, notwithstanding this laryngeal affection, is a satisfactory proof of the influence of the treatment on the course of the pulmonary disease. Case 2 terminated fatally, but the influence of the treatment on this case during the first summer he camped out was most marked. After the treatment was given up, and the patient returned to the Eastern States, the disease advanced rapidly, and ended fatally in a few months.

In the above sketch of seven cases of well-marked phthisis it will be seen that there are three in which the disease had advanced to its third stage and four in which it was at the second stage. Of the cases in the third stage one has died, having stopped the treatment and returned to the Eastern States. Of the others one has been gradually improving during an interval of four years, and will I believe ultimately recover. The other, after an interval of three years, is almost well, having during the last two years been attending to his business, as a lawyer, without inconvenience, improving in health and slowly gaining in weight. Of the other four cases in which the disease had advanced only to the second stage, two are certainly cured; one (case five) has been free from any pulmonary symptoms during the last five winters, and the other (case seven) has been entirely free from cough during the last eighteen months, and is now enjoying better health than he has had for some years. Of the other two, case six has died, having substituted wet sheets for living in the open air. Of the case with the laryngeal affection I have no certain data, but I believe the

disease is slowly progressing, treatment having been neglected during the last summer. In each of the three cases in which the disease had advanced to the third stage, improvement must be ascribed to the hygienic advantages secured by living in the open air, under most favourable conditions as regards elevation, climate, and wholesome nourishing diet, as in all three, careful treatment under ordinary conditions had failed to arrest the progress of the disease. The same remarks will apply to case three, in which there was only softening. In the other three cases, in which the disease had advanced only to the second stage, improvement took place whilst the treatment was being carried out in a modified form. In each case living in the open air as much as possible was, I believe, the most important element in the treatment, although this was carried out under less favourable conditions than can be found, to our coast range at an elevation of three or four thousand feet.

I have to apologize for the imperfect manner in which the results of some of these cases are reported, from my having had to trust to written communications from some of my patients as to their present condition. But in so unsettled a population as that of California, it was impossible to obtain this information in any other way. I have reported no case in which I had not satisfied myself of the existence of the disease. I have seen many others in which I have not the least doubt but that the disease has been cured by living out on the plains for some months; but on these I possess no certain data. Their scientific value is slight, although they sufficed to lead me to adopt the plan of treatment that has led to such favourable results. I am sure also that physicians who have been residing on the western frontier for some years must have seen many cases in which they *knew* the disease had been arrested and even cured, by one or two years' residence amongst the Indians and trappers of the Rocky Mountains.

Unfortunately but few localities afford facilities for fully carrying out this plan of treatment. Certainly in no other part of the globe can it be more readily tried than on this coast. For six months in the year we have a rainless climate, during the whole of which time our patients can live in the open air, under the most favourable hygienic conditions, and when the rainy season here would drive them into houses, a sea voyage of four or five days brings them to Northern Mexico, where, during the winter months, they can enjoy a climate exactly analogous to our summer climate here, as in that country rain only falls between June and October. The intervening months being absolutely rainless. I have seen cases of consumption, in which a winter's residence there has been most beneficial, and I have a patient wintering there at present, who is reported as improving rapidly, although the disease had advanced to the third stage. When our patients are in a position to avail themselves of the advantages of the summer climate of California, and of the winter climate of Mexico, I believe there are few cases, except those in which the destruction of lung

tissue is already too extensive, that cannot be cured. Many cases, both in the first and second stages, can be cured by merely passing the summer out of doors in this country, but even in these, I believe wintering in Mexico would very much shorten the treatment. In all cases that have advanced to the third stage, wintering in Mexico should be recommended, as the treatment is much prolonged by the aggravation of the symptoms, during the time that the open air treatment has to be suspended. Every case, however, must be treated on its own merits; the time and means required for restoration to health, being more dependent on the general pathological and diathetic condition of the patient, than on the amount of change that has taken place in the lungs.

It is not my intention at present to enter on the questions of pathology and treatment which the above facts naturally suggest. This I hope to do on some future occasion. Their most important bearing I believe is, the support they bring to the views of those who place their chief reliance on the hygienic treatment of the disease. How striking a confirmation do these facts offer of the remark of Dr. Richardson, who, in his work on Consumption, observes:—

"In a cozy room the consumptive is bound never to live, nor in any room indeed, for any great length of time. So long as he is able to be out of doors, he is in his best and safest home. In the fields, on the hills, wherever the fresh air vivifies, where plants look most vigorous, and animals frisk about in the joy of health, there will the consumptive draw in his choicest medicine, there dissolve and throw off most freely the germs of his disease, and there repair most easily the tissues he has lost."—*The Hygienic Treatment of Pulmonary Consumption.* By Benjamin W. Richardson, M. D. Page 8.

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ART. IV.—*On the Organic Nitrogenized Principles of the Body, with a New Method for their Estimation in the Blood.* By AUSTIN FLINT, JR., M. D., Professor of Physiology and Microscopy in the Bellevue Hospital Medical College, New York, and in the Long Island College Hospital.

PART I. *Composition and Properties of the Organic Nitrogenized Principles of the Body.*—The physiological investigator of the present day is greatly dependent upon Chemistry as a means of ascertaining the functions of the body; so much so, indeed, that these departments cannot be separated from each other, and it is to Physiological Chemistry we must look for the solution of questions of the highest importance which yet remain unanswered. Among the various questions which thus remain to be answered by the Chemist, that of the quantity, composition, condition of existence, and changes, of the organic nitrogenized principles is the most

important; for these apparently are the constituents of the body endowed with vital properties; they regulate the changes which take place in the other principles, and the various modifications which they undergo in the body constitutes the mysterious "life," the comprehension of which has not yet been granted to the student of Nature. Though chemistry has enabled us to make but little, if any, progress towards the solution of the great question of vitality, it has helped us to comprehend certain of the phenomena of living bodies; and by long searching we have found out some of the laws which regulated their phenomena. The results of the physiological labours of centuries have only confirmed a great principle which must be recognized by every one who hopes to make any advance in this science.

*The laws which regulate animated nature are irrevocably fixed; as distinct from those which govern inanimate objects as life is from death. They must be sought for by a patient study of the phenomena of life till the chain of evidence is complete. The mind must seek to comprehend, not to create.*

Much ineffectual labour has resulted from a lack of comprehension of this great principle. While Physiology was comparatively new as a science, many endeavoured to establish laws for the regulation of the economy instead of adding to our knowledge of phenomena; and others, ignorant of the fact that what is true of inanimate matter cannot be applied to the living body, endeavoured to explain everything by physical or chemical laws. To this latter circumstance may be attributed the want of application of chemistry to physiology until within the last few years; though, in all ages, when learning has been cultivated, chemistry has been a favourite study. They who took such pride in the discovery of elements, and the establishment of physical laws, could not bring themselves to admit, and cannot, at the present day even, that the body is anything but a collection of those elements regulated by the laws with which they were familiar; while they who saw these laws so often violated in living bodies, were disposed to reject entirely chemical and physical explanations of physiological phenomena. Hence arose the classes of vital and chemical physiologists. To make use of chemistry, from which physiology had so much to expect, it was necessary to create a new mode of study which should have reference to organic substances, and to substances not necessarily chemical elements, but formed from these elements, which are now called *Proximate Principles.* It will be seen at once how important are these principles with reference to their condition and behaviour in the living body, and how necessary it is to study them from this point of view, and not simply as inorganic or inanimate compounds.

There is thus a manifest difference between a proximate principle and a chemical element. The former has certain properties in the living body which are different from any known in the inorganic world. They may

be properties peculiar to animal substances, such as albumen or musculine, which are endowed in living bodies with the vital properties of continual destruction and reparation; or the substance may be inorganic, as water or chloride of sodium, but actually entering into the composition of organized tissues, and participating in the peculiar vital changes which they undergo. The latter is an indivisible substance, possessing no power of self-regeneration, forming definite compounds by unison with other elements of the same class, by which union the properties of all the components are radically changed. Chemical elements can be studied, and have been studied for years, without reference to organized or living structures, though these are formed necessarily of such elements, and as such have been found to possess certain definite properties. When the chemist, in investigating organic bodies, studies only the ultimate elements of which they are composed, he learns nothing more of the properties of these elements, for they are identical with those he extracts from inorganic substances. He gives us simply the results of decomposition of the body; while, what we wish to know, is, the function of the systems and organs, and the elements which compose the tissues of the body. The ultimate composition of organic bodies is manifestly of little importance compared with a knowledge of their physiological properties; unless, indeed, this should explain their function, a hope of the chemist which is rarely realized. Thus the body cannot advantageously be studied from a purely chemical point of view; and the changes which take place, even in its inorganic constituents, cannot be explained by formulæ which indicate simply the addition or subtraction of certain elements. Within a few years a great advance has been made in physiological chemistry by a modification of the mode of study of organic principles. The most rational investigators of the present day treat them as compound substances, which cannot be decomposed without destroying their properties. But a still further advance is necessary: they must be considered, not merely as proximate principles, which can be separated from the body by means which do not interfere with their chemical composition, but as principles capable of performing their functions only when united together, as they certainly are in Nature. For example, what has been considered as albumen, that is, dried albumen, is incapable of performing its function if it be not united with water, chloride of sodium, and other inorganic substances which are always found in connection with it; and though it be interesting to know its ultimate composition, and its behaviour on the application of heat, in the presence of acids, etc. etc., these phenomena are artificial, and useful only as tests; while our true line of inquiry lies in a study of its behaviour in the body, and the investigation of natural, rather than artificial phenomena. Instead of attempting to isolate it completely, we should rather study its union with the other principles by which it is enabled to perform its functions; and when we separate it from the animal fluids in order to ascertain its proportionate quantity, we should separate with it those other sub-

stances which are united with it in the living body, without which it can perform no vital functions. We shall see that some of these substances, as water, actually enter into the composition of the organic principles, and cannot be separated without alteration and decomposition.

These preliminary remarks explain why I consider it of the greatest importance to study, first of all, *the condition under which organic substances exist in the body;* more especially as this question is almost ignored by physiologists. We shall find that, to correspond with the ideas I shall present upon this important question, a new method of estimating the quantity of these substances will be necessary, as the analyses which we now have are the work of chemists who have not appreciated their condition of existence. In discussing this question, it will be necessary to review to some extent the opinions and analyses of chemists which are accepted at the present time.

*Ultimate Composition of Organic Nitrogenized Substances.*—According to the present received views, every tissue of the body, and all the fluids, with the exception of the excrementitious fluids, contain a characteristic element, which is found in no other situation, and which gives to it certain properties connected with nutrition, which may be called vital. Generally, these tissues and organized fluids contain but one characteristic organic element, which takes its name, with the termination *ine*, from the situation in which it is found. Thus *musculine* is the organic element characteristic of muscular tissue; *osteine*, of bony tissue; *cartilagine*, of cartilage: and among the fluids we have *pancreatine* for the pancreatic juice; *mucosine* for the mucus. With the exceptions of the blood and milk, there is but one such element to each tissue or fluid. The blood, however, which furnishes the material for the formation of all these substances, contains several organic substances, *i. e.*, *fibrin*, *albumen*,[1] and globuline; and the milk contains, in addition to *caseine*, a trace of albumen. Though it is probable that all the tissues and organized fluids (excrementitious fluids excepted) contain elements of this kind which are characteristic and present shades of difference for each one, they have not yet all been separated sufficiently for purposes of study; and, according to Robin and Verdeil, only seventeen can be regarded as well established.[2]

*List of Organic Nitrogenized Substances.*

| Name. | Where found. |
|---|---|
| Fibrin . . . . . . . | Blood, chyle, lymph. |
| Albumen . . . . . . | Blood, chyle, lymph, serum, milk. |
| Albuminose . . . . . . | Chyme, blood. |
| Caseine . . . . . . . | Milk. |
| Mucosine . . . . . . | Mucus. |

[1] These are called by the French Fibrine and Albumine, but they are more commonly known in English as Fibrin and Albumen.

[2] Traité de Chimie Anatomique, etc., par Ch. Robin et F. Verdeil. Paris, 1853.

| Name. | Where found. |
|---|---|
| Pancreatine | Pancreatic juice. |
| Globuline | Blood-globules. |
| Musculine | Muscles. |
| Osteine | Bone. |
| Cartilageine | Cartilage. |
| Elasticine | Elastic tissue. |
| Keratine | Nails, hair, epidermis. |
| Crystalline | Crystalline lens. |
| [1] Hematine | Colouring matter of the blood. |
| Biliverdine | " " " bile. |
| Urosacine | " " " urine. |
| Melanine | " " " pigment. |

Of the seventeen principles above enumerated, only three have been studied with any degree of accuracy; namely, fibrin, albumen, and caseine. The proportion of these elements in the fluids in which they have been found has been carefully estimated, and, in addition, much pains have been bestowed upon their ultimate analysis. Albumen, the one with which we are most familiar, has given the name to all these substances, from similarity, as far as known, of composition, &c., and the remainder, thus called *albuminoids*, have been simply indicated in the situations above enumerated, no attempt having been made, with one or two unimportant exceptions, to estimate their quantity or ascertain their ultimate composition. In fine, the blood and the milk are about the only fluids of the body which have been subjected to critical analysis for organic substances; and hardly anything has been done with the solids. I do not propose in this article, to take up the chemistry of the milk, and, throwing out this fluid, I am reduced in my examination of analyses to the organic elements of the blood, which has justly claimed the most careful investigation at the hands of the physiological chemist.

In the latter part of the last century, Berthollet discovered the existence of nitrogen in organic bodies. Before his time chemists had little idea of their composition. It was known that they were very unstable, and the discovery of the above-named ingredient offered a supposed explanation of this fact; *i. e.*, that its presence engendered a number of "attractions" which did not operate in bodies of a less complicated composition. This discovery was a great step in the chemical knowledge of organic substances of this class; and the researches of investigators since that time have so far established it, that they are known generally under the name of *nitrogenized*, or *azotized* principles. The organic matters were then closely studied by Dumas, especially those existing in the blood; and, indeed, the mode of analysis of this fluid for its organic ingredients employed by Dumas forty years ago, is the one adopted, with but slight modifications, by che-

[1] These are simply colouring matters, and are put by Robin and Verdeil in this class, as they contain nitrogen.

mists of the present day. He ascertained, in the first place, the amount of water which could be driven off from the blood, and attributed it all to the serum, considering the fibrin and albumen as held in solution by this water, and the globules as possessing no fluid of their own. By appropriate means, which will be considered hereafter, he separated the fibrin, albumen, and globules, evaporated them to dryness, and estimated them in this condition. The ultimate composition of these principles was not then definitely ascertained, and no theory of the mode of union of their elements or their formation was proposed. A few years later (1837), in connection with Liebig, Dumas proposed a division of chemical science into inorganic or mineral, and organic. According to the theory thus proposed, all inorganic bodies were composed of two elements directly combined, forming what they called binary compounds, which again united with other compounds formed in the same way. Thus, potassium and oxygen united to form potash (KO), which, in its turn, may unite with another binary compound, as nitric acid ($NO_5$), to form nitrate of potash ($KO,NO_5$); the elements first uniting together to form pairs, which, in their turn, unite with each other. In inorganic chemistry the union of elements proceeds, in this simple manner, to form the most complex substances; an element can only unite with an element, a binary compound with a binary compound, and so on. Organic, particularly vegetable substances, on the contrary, were theoretically reduced to the compounds of a radical which, though itself a compound, behaved towards elementary substances in the same way as a simple inorganic element. In other words, the behaviour of these so-called organic radicals in their union with elementary substances would lead us to suppose them to be elements themselves; it is only chemical analysis which shows them to be compound. For example, cyanogen will unite with hydrogen to form hydrocyanic acid (HCy), as chlorine will unite with hydrogen forming hydrochloric acid (HCl). The latter is an inorganic or mineral acid, and the chlorine, which is the radical, is of necessity an elementary substance; but cyanogen, the radical of the organic acid, though it unites with the element hydrogen in the same way as the chlorine, behaving like an elementary substance, is found by chemical analysis to be a compound of carbon and nitrogen ($C_2N$). It is in reality a radical, but compound, and a compound radical is a thing unknown in inorganic chemistry. The example just given shows a marked difference in the behaviour of inorganic and organic substances, as the radical $C_2N$, or cyanogen, actually exists and conducts itself, as we have seen, not as a compound, but an elementary substance; and if all organic compounds could be shown to be formed of compound radicals, this would constitute a true distinction between mineral and organic combinations. But this is not the case; though some chemists have theoretically reduced alcohol, ether, acetic acid, and in fact all organic vegetable compounds, to a union of elements with compound radicals, the radicals, unlike cyanogen, are hypothetical. It is said, for example, that the radical ethyle

($C^4H^5$) unites with oxygen to form the oxide of ethyle ($C^4H^5O$), which is ether; with oxygen and an equivalent of water, to form the hydrated oxide of ethyle ($C^4H^5O+HO$), in alcohol, etc. etc., but ethyle never exists in nature, and cannot be manufactured. The same is true of the radicals, methyle, acetyle, benzoile, ammonium, &c. The hypothetical character of these radicals is universally acknowledged,[1] and the theory of compound organic radicals, though it may serve to explain the composition of certain classes of organic bodies, is not universally received by chemists of the present day; it is rather a mathematical analysis than an actual investigation of real substances; for, with the exception of one or two, *all the radicals are hypothetical.* This wholesale assumption of imaginary substances violates, *in toto*, the principle enunciated at the beginning of this article. Instead of studying the phenomena of organic bodies, phenomena are imagined and facts distorted to correspond to the laws which are known to regulate the behaviour of inorganic substances. But it is beyond the scope of this paper to treat of these purely chemical questions; the reason the theory of organic radicals has been discussed at all is, that it was followed the next year, 1838, by the theory of Mulder, by which he attempted to explain the constitution of the albuminoids. He supposed all organic nitrogenized substances in the body to be formed by the union of certain elements with a radical, *proteine*, giving to them the name of proteine compounds. This hypothesis was adopted by Liebig, Dumas, and Simon, and is now accepted by many physiologists. It is then one of the most important questions which we have to discuss in studying the composition of organic nitrogenized bodies.

*Proteine.*—As before remarked, the only albuminoids that have been carefully studied are fibrin, albumen, and caseine. In addition to a great similarity in the general properties of these substances, ultimate analysis has shown a remarkable likeness in chemical composition. It is not to be wondered at, then, that an attempt should be made to reduce all the compounds of this class to a series derived from a common radical, following upon the theory of organic vegetable radicals, which was first pretty generally received. This was done by Mulder; who, treating albumen, fibrin, or caseine with alcohol and ether to remove the fats, and with hydrochloric acid to remove inorganic salts, dissolved these substances, thus purified, in a solution of potash, and precipitated by acetic acid a substance said to possess always the same characters, which he called the radical of the albuminoids, and which, by union with a certain quantity of sulphur and phosphorus, was capable of forming fibrin, albumen, or caseine. This, which is merely

[1] For a *résumé* of the history of these so-called organic radicals the reader is referred to a lecture by M. Auguste Cahours, published by the Société Chimique de Paris, 1860, p. 51.

an extension of the theory of compound organic radicals into animal chemistry, has a more plausible basis than in the formation of vegetable organic compounds. The supposed radical proteine was obtained and analyzed by Mulder; and if it could be definitely established to be the same for the various substances from which it is extracted, and if these substances could be shown to consist always of this radical with a definite proportion of sulphur, or sulphur and phosphorus, the theory would be sustained, as far as possible with our present means of investigation. It is true it would only be sustained by analysis, but synthesis cannot yet, if indeed it ever can, be applied to animal chemistry; for we have thus far been unable to construct a single organic principle of the body out of its elements. But the proteine theory is not susceptible of analytical demonstration. The composition of proteine itself is not definitely settled; and when we come to review the methods of ultimate organic analysis, we will see that the varied results obtained by chemists do not depend on a want of accurate means of analysis, but upon the indefinite characters of the compounds themselves. Let us take, for example, the analyses of Mulder[1] showing the composition of the proteine groups, and compare them with the results obtained by other chemists!

Mulder gives the following formulæ for the proteine group:—

$C^{40}H^{31}N^{5}O^{12}$ = Proteine.

$C^{40}H^{31}N^{5}O^{12} + SPh\frac{1}{2}$ = Fibrin and albumen of white of egg.

$C^{40}H^{31}N^{5}O^{12} + S^{2}Ph\frac{1}{2}$ = Albumen of serum.

$C^{40}H^{31}N^{5}O^{12} + S$ = Caseine.

This analysis of Mulder has been confirmed by Schröder and Von Laer.[2]

Regnault gives as the constitution of proteine $C^{36}H^{23}N^{4}O^{10}$;[3] Sheerer, $C^{48}H^{72}N^{12}O^{14}$;[4] Liebig, $C^{48}H^{36}N^{6}O^{42}$; and Dumas, $C^{48}H^{35}N^{6}O^{17}$.[5]

The composition of fibrin, albumen, and caseine given by Dalton, and credited to Liebig, is as follows:—[6]

Fibrin = $C^{298}H^{228}N^{40}O^{92}S^{2}$
Albumen = $C^{216}H^{169}N^{27}O^{65}S^{2}$
Caseine = $C^{288}H^{228}N^{36}O^{90}S^{2}$

Denis, in a paper presented to the Academy of Sciences at Paris in 1839, advanced the view that fibrin and albumen are identical in composition; which view was sustained by Liebig in a note to the Academy in 1841.[7]

[1] Robin and Verdeil, Chimie Anatomique, tome i. p. 652.

[2] Animal Chemistry with reference to the Physiology and Pathology of Man. By Dr. J. Franz Simon. Philadelphia, 1846.

[3] Cours Elémentaire de Chimie, etc. Par M. V. Regnault. Paris, 1853, tome iv. page 114.

[4] Milne-Edwards. Leçons sur la Physiologie, etc. Paris, 1857, tome i. p. 151.

[5] Robin and Verdeil, op. cit., tome i. p. 651.

[6] Dalton's Treatise on Human Physiology. Second edition. Philadelphia, 1861, p. 80; and Robin and Verdeil, op. cit., tome iii. p. 147.

[7] Robin and Verdeil, op. cit., tome iii. p. 282.

With this diversity of opinion among chemists, based on actual analysis, it is impossible to come to any other conclusion than the following:—

There is no evidence that fibrin, albumen, and caseine are formed by the union of a *definite proportion* of phosphorus and sulphur with a common radical.

In addition it is certain, if we attach any weight to ultimate analyses, that the properties of these substances do not depend entirely on their chemical composition. If we look at the analyses of Mulder, even, we find that two substances as dissimilar as it is possible for substances of this class to be, namely, albumen of the white of egg and fibrin, have the same ultimate composition. The minute composition then does not seem to be important as regards the general properties of the compound. Let us now see whether this composition be invariable or not; whether, in other words, these compounds are not of *indefinite chemical composition.*

Notwithstanding all the labour which has been bestowed upon the ultimate analysis of the substances under consideration, the question of their composition does not seem to be one of any great importance. The difficulties of such an analysis, and, as we have just seen, the contradictory results in the hands of skilful chemists, show that a knowledge of the ultimate composition of organic nitrogenized substances is of little value as a means of distinguishing them from each other; and such an analysis throws no light whatever on their function in the economy. A careful review of the facts which have been accumulated on this subject leads to the conclusion that *these bodies are of indefinite chemical composition.* In the first place they are not crystallizable; secondly, they may be made to assume different forms and properties by the action of imponderable agents, as in coagulation by heat or galvanism, without losing or gaining any elements; thirdly, they are in a continual state of change, in nutrition during life, without losing their properties, and will continue to absorb oxygen and exhale carbonic acid for some time after removal from the body,[1] and shortly after these properties have ceased, undergo the changes of putrefaction; lastly, there is no great difference between them in chemical composition, and almost all the analyses made by chemists of equal skill present great variations. Is there not, then, every support for the assertion that their chemical composition is indefinite? Either this assertion is correct, or the methods of analysis employed are inaccurate. As so much depends upon this point, I will venture to give a rapid sketch of the method of analysis most commonly employed by chemists.

It is first ascertained, by a very simple process, that a given substance,

[1] G. Liebig has demonstrated the fact that the muscles of the frog will continue to absorb oxygen and exhale carbonic acid after they have been separated from the body, so long as they retain their contractility. Lehmann's *Physiological Chemistry*, Philadelphia edition, vol. ii. p. 474.

say albumen, is composed of certain elements, as carbon, hydrogen, oxygen, nitrogen, sulphur, and phosphorus. This being determined, it is deprived of moisture; the fat is removed by ether and alcohol; and the earthy salts, as far as possible, by dilute hydrochloric acid. A carefully weighed quantity is then decomposed, and the proportions of these elements determined, in the following way:—

*Mode of Analysis.*—A tube of the hardest glass, a half an inch in diameter, sixteen to eighteen inches long, and closed in a flame at one end, is used for the decomposition, which is effected by combustion. The oxidation is effected by means of the black oxide of copper, which is prepared for the purpose perfectly pure, carefully powdered, and freed from every particle of moisture. The tube is first filled for two or three inches with pure oxide of copper. The organic matter is now to be carefully powdered, incorporated with oxide of copper (it is best to employ from five to eight grains of organic matter for the analysis), taking care that not a particle be lost, and the mixture introduced into the tube. The tube is now to be filled to within an inch of the extremity with the pure oxide of copper.

In performing this part of the manipulation, care should be taken to remove all moisture, as this would affect the quantity of hydrogen obtained from the combustion. This may be done by attaching the tube, after it has been filled, to one opening of a small air-pump, such as is used for this purpose, the other being fitted to a bent tube filled with pumice stone and sulphuric acid. By placing the combustion tube in a long dish filled with warm water and exhausting the air a few times, all the moisture may be removed.

As the tube is to be subjected to considerable heat, it is best to wind it with a narrow ribbon of sheet brass, which will prevent its bending when it becomes softened. We now attach to the open end, by a smaller tube fitted perfectly with a cork, a light tubular apparatus filled with small fragments of chloride of calcium, the tube and its contents having been previously weighed, and we connect with this a series of bulbs, called Liebig's potash bulbs, partly filled with a solution of caustic potash, which is likewise carefully weighed. The heat may now be applied to the combustion tube, which may be done in a long glass furnace made for the purpose, or by surrounding it, well supported in a long iron trough, with hot coals. The heat is applied gradually, beginning at the nearer end of the combustion tube. The organic substance is thus completely decomposed, and if it were composed of carbon, hydrogen, and oxygen, like sugar, the analysis would be complete—this combustion giving us the carbon and hydrogen, and the oxygen being obtained by difference. As it is, all the hydrogen is converted into watery vapour, which is absorbed by the chloride of calcium, and the carbon, converted into carbonic acid, is absorbed by the potash. The weight of these products is ascertained by taking the increase

of weight of the calcium tube and the potash bulbs, and the quantities of *carbon* and *hydrogen* are deduced therefrom.

We have now remaining the nitrogen and sulphur. We may use the same tube, with a little modification, for carbon, hydrogen, and nitrogen; but it is better to estimate the latter in a new apparatus. For this purpose we take a combustion tube similar to the one just described, placing at the closed end a few grains of bicarbonate of soda; then the oxide of copper as before; next the mixture of oxide of copper and the organic matter; next another layer of pure oxide of copper, and last of all a layer of pure copper reduced by hydrogen. The extremity is then connected with one opening of the air-pump, and to the other is adapted a tube which opens under a receiver containing mercury with a solution of potash floating on the top. We then exhaust the air as completely as possible and connect the combustion tube with the receiver by opening both stopcocks of the air-pump. It is necessary now to drive out all the air from the apparatus, as we wish to collect the nitrogen in a gaseous form. For this purpose we apply the coals to the further extremity of the tube, when the heat decomposes the bicarbonate, and carbonic acid gas is evolved. We see that all the air is driven off, by the complete absorption of the gas evolved by the potash in the receiver, showing that pure carbonic acid is coming over. We then substitute another receiver filled with mercury and a solution of potash, withdraw the heat from the bicarbonate, and apply it gradually from the anterior portion of the tube as before. Combustion of the organic matter takes place, which results in watery vapour, carbonic acid, which is absorbed by the potash in the receiver, and nitrogen, which passes over and is collected in a gaseous form. Some of the nitrogen is oxidized by this combustion, but as it passes over the hot metallic copper in the nearer extremity of the tube, the oxygen is retained and the nitrogen passes over pure. After the combustion of the organic matter is complete we again apply heat to the bicarbonate of soda so as to drive off what nitrogen remains in the tube by the evolution of carbonic acid. We then remove the receiver, substitute water for the mercury, measure the volume of the gas, taking the temperature carefully and bringing the level of the water in the tube to that of the surrounding liquid; thence deduce its weight, which gives us the proportion of *nitrogen*.

The sulphur and phosphorus, if there be any, exist in very small quantity. They may be estimated in the albuminoids without any great difficulty, by causing them to unite with soda, as sulphuric or phosphoric acid, and then precipitating with the chloride of barium for the sulphur, and by a process a little more complicated, but not less exact, for the phosphorus, which it is not necessary to describe here.[1]

[1] An admirably clear exposition of the whole process for the analysis of organic substances, with all the precautions for making it perfectly accurate, is found in Regnault's *Cours El mentaire de Chimie*, tome iv. p. 9 et seq.

We have thus obtained the weight, in a given portion of albumen, of all its ingredients but the oxygen, *i. e.*, carbon, hydrogen, nitrogen, and sulphur. By subtracting the sum of the weights of these substances from the whole weight, we have the oxygen; and reducing to 100 parts we have the ultimate composition.

I have given the process rather fully, to show how, with certain precautions, in the hands of one skilled in chemical manipulations, it may be made as accurate as any operation in inorganic chemistry. With a balance that will turn with less than $\frac{1}{1000}$ of a gramme, and with care to avoid moisture, etc., in the apparatus, the result should be always the same, if the substance analyzed had always the same composition.

The next step is to establish the formula in equivalents. If the substance used were an acid or a base, which combined with any substance of known combining equivalent, this would be easily done, by getting the weight of a combining atom by experiment, calculating the proportions of its ingredients to this weight, and dividing the quantity of each element thus obtained by its combining equivalent. But in the case of the albuminoids, which are neutral, this cannot be done.[1] A formula is calculated for them which ex-

[1] The following extract from a note from Prof. B. Silliman, Jr., of New Haven, which he has kindly permitted me to publish, gives the views of this eminent chemist on the important question of the determination of formulæ for the albuminoids.

"If I understood correctly your inquiry the other day respecting the formulæ of the albuminoid substances, the difficulty in your mind was, to determine on what principle a given formula was selected from a certain ratio of numbers. There is, in truth, a serious difficulty in stating the formulæ of all organic bodies; but there are, nevertheless, certain general rules which guide the chemist in such cases. Take, for example, the composition of *alcohol*, the commonly received formula of which is $C_4H_6O_2$. The percentage composition is of course very easily ascertained from this formula, thus

$$C_4 \quad H_6 \quad O_2.$$
$$24+6+16=46.$$

$46:24=100:x=52.18$ per cent. of Carbon.
$46:\ 6=100:x=13.04$ " " " Hydrogen.
$46:16=100:x=34.78$ " " " Oxygen.

"But it is plain that any multiple or submultiple, of the established formula for alcohol will present the same *ratio;* thus we may have

$C_2\,H_3\,O$
$C_4\,H_6\,O_2$
$C_6\,H_9\,O_3$
$C_8\,H_{12}O_4$, &c.

"Which shall we select? Usually the simplest, or that which gives the smallest number of whole equivalents. But in case of bodies which, like alcohol, are volatile, we have a specific guide in the *vapour density*, which will vary, of course,

presses the elements in the simplest manner so as to give no fraction, and generally giving an even number for the atoms of carbon.[1] Thus Liebig gives the formula of fibrin $C^{298}$ $H^{228}$ $N^{40}$ $O^{92}$ $S^{12}$.

This review of the mode of ultimate analysis of organic nitrogenized bodies, makes it evident to any one in the slightest degree conversant with chemical manipulations, that the contradictory results obtained by different chemists are not due to imperfections in the analytical process; indeed, the process is acknowledged by chemists generally to be as accurate as that for the determination of the composition of inorganic substances. The only way, then, to explain the contradictory results obtained by different chemists of equal skill and reputation, is to assume that the chemical composition of the principles is indefinite. While enough has been said to convince the reader of this fact, it follows that important results are to be expected rather from a study of the condition and behaviour of these substances in the economy, than their decomposition into elements. When they have been extracted from the body, they are by no means in the condition under which they normally exist. This being the case, it is for the physiological chemist to give their quantity, properties, etc., as far as he can, *in the condition in which they really exist in life;* the physiologist then takes them and studies the vital phenomena in which they are concerned. Here comes the important question: *What is the condition of existence of the organic nitrogenized elements in the body?* On the answer to this question depends the mode of proximate analysis of the organized fluids of the body, especially the blood, which is all important to the physiologist.

*Condition of Existence of Organic Nitrogenized Substances in the Body.*—In the ordinary proximate analysis of the blood, by which is meant

with the number of equivalents, and serves as a definite control over the symbol or formula.

"As regards the composition of the albuminoids, you will remark that they are all derivatives of cellulose by removal of three equivalents of water, and the substitution of three equivalents of the elements of ammonia. Thus $C_{24}H_{20}O_{20}+3NH_3=6H_2O_2+C_{24}H_{17}N_3$. This view, first presented in 1845, in my *First Principles of Chemistry*, by Mr. Hunt (pp. 512, 513, edition of 1852), coincides in a very remarkable manner with the best analyses of fibrin and protein by Mulder. By it protein is a nytril or amid of Cellulose, and in accordance with this, when protein is dissolved in concentrated hot chlorhydric acid, it yields ammonia (as sal ammoniac), water and a brown insoluble substance identical with that resulting from the slow decay of wood. This view for a long time lay unregarded, but lately has been brought out again as new by Dusart and other continental chemists. (See *Am. Journ. Sci.*, 1848, vol. v. p. 74; 1862, vol. xxxiii. p. 113.) I commend this subject as therein set forth to your perusal.

"In a physiological point of view, as an example of the results of vital chemistry, the production of albuminoid bodies from cellulose, has always appeared to me to be one of the most interesting topics in organic chemistry."

[1] Regnault, Chimie, op. cit., tom. iv. p. 54.

an analysis giving the proportions of proximate principles without any reference to their ultimate composition, the albumen and fibrin are put down in a very small proportion. Fibrin is recognized by its spontaneous coagulability, and albumen by its coagulability by heat and nitric acid; and we know that the fibrin may be extracted from the blood coagulated on rods, and the albumen of the serum solidified by heat or nitric acid, in quantities which are evidently much greater than those given in analyses. The physician finds it difficult to reconcile to his ideas of albumen and fibrin of the blood, the proportions of sixty to sixty-five parts per thousand for albumen, and two and a half for fibrin. The reason why the estimates fall so far below our ideas, is, that chemists never have estimated the fibrin and albumen as they are separated from the fluids by coagulation, which only changes their form and not their weight; but after separating them in this way, have subjected them to perfect desiccation. We have therefore not the weight of the principles as they exist, not the fibrin and albumen which are calculated to nourish the body, but the desiccated substance, altered, and its properties destroyed, by this process. Physiologists tell us that fibrin and albumen are in solution in the water of the blood, and that their natural condition, in a state of purity, is that of a dry powder. In this case it is extremely difficult to reduce these substances to their natural condition. When we coagulate them, which, according to this view, is a precipitation, a large quantity of water persistently remains in combination with them which it is very difficult to get rid of, and when got rid of, the dry substance must be weighed quickly and with many precautions, to avoid a resorption of moisture. Other matters are also found combined with the coagulated organic substance. All the salts which are found in the blood are united with it as well as the water; and in the proximate analysis, these salts are not generally separated from the organic substance before it is weighed. This view, which is almost universally held by physiologists, is the one which has guided all the analyses which we have of the organized fluids. In the original works to which I have access, that of Robin and Verdeil, on Anatomical Chemistry,[1] is the only one in which I find any dissent from the prevailing doctrine. They regard the organic elements of the fluids as naturally fluid and not in solution; those of the semi-solids as naturally semi-solid; and of the solids as solid. The contrary view seems to me radically and entirely wrong; and all analyses of the organized fluids, made with the idea that organic substances are in solution, fail to give anything like a correct idea of the properties of these substances. The analyses of the blood which are embodied in the latter part of this paper, are the only ones, as far as I know, which have been attempted with reference to the real condition, as it seems to me, of the organic constituents. They have been made on the following principle:—

*The water which is contained in coagulated organic substances, which*

[1] Op. cit., tom. iii. p. 121.

*may be driven off by dry heat, &c., is not part of the water which held the organic matter in solution, but an actual constituent of the substance, as much as the carbon, hydrogen, or nitrogen, and indispensable to the properties by which we recognize it as an organic principle.*

It has already been shown that ultimate analysis does not give us an idea of the distinctive characters of different organic matter. For this we must depend upon certain characters which are found in all principles of this class, and further, upon certain properties which serve to distinguish them one from another; and when deprived of their water of composition by desiccation, neither in their general properties nor in chemical composition do we have any means of recognizing them, unless it be, by their indefinite chemical composition and the impossibility of making them assume a definite or crystalline form.

First, with regard to their general properties. They all undergo a change peculiar to themselves, called putrefaction. This property, which is the one perhaps most distinctive of organic matter, is abolished when they are deprived, even partially, of water; a fact which is well known and of which we have a familiar example in the preservation of meat. Again, when an organic substance is in a state of putrefaction, it is capable of inducing the same change in other elements of this class by what is called catalysis, or acting as a ferment. As water is necessary to putrefaction, it is consequently necessary to the development of this property. Principles of this class also undergo a change peculiar to themselves in cooking; which is characterized by the development of volatile empyreumatic substances. Water is necessary to this change, for if exposed to heat after water has been driven off, as has already been seen in the study of the mode of ultimate analysis, they are resolved into their elements without undergoing any such change. They also are capable of regaining their water of composition after desiccation, possessing to an eminent degree what is called the property of hygrometricity, by which they are returned to the condition they assumed when first coagulated. This coagulability is also a peculiar property, and entirely different from precipitation from a solution. They cannot be redissolved in the fluid from which they are separated by coagulation. For example, albumen, and indeed all of them are insoluble in alcohol; but if albumen be coagulated by alcohol, and afterwards freed from it, it cannot be redissolved by pure water, or the fluid from which it was separated. When once coagulated they have undergone a change, and cannot be redissolved except by means which change them still more. When they have been coagulated and dried, reduced to what is called a condition of purity, they cannot be redissolved and detected by their property of coagulation, for they are changed, and consequently not in their natural condition.

When we are asked what we mean by fibrin, we answer that it is an organic constituent of the blood, which possesses the property of coagulating

when removed from the body, giving this property to the whole mass of blood, which separates, after a time, into clot and serum. We would define albumen as a principle of the same class, existing in the serum, which is coagulated by heat or nitric acid. These are naturally fluid, but coagulate, in the one instance spontaneously, and in the other by the means just mentioned. We cannot say that they are principles composed of so many atoms of carbon, nitrogen, &c., because their composition is indefinite. If asked the proportion of these principles contained in the blood, we can only say that after they have been separated from this fluid, and after all their water has been driven off, there have been found $2\frac{1}{2}$ parts of fibrin, and 60 or 70 of albumen per 1000. This latter answer conveys to us no idea of the real quantity, for we care nothing about the quantity of anhydrous matter contained in these substances, we wish to know the quantity of *coagulating* fibrin and albumen found in the blood. Analyses giving the quantities of these substances as near as possible in their natural condition, have never been made, though they would seem the only ones which could convey any definite idea of what we wish to know. I have attempted to supply this deficiency, to a certain extent, in Part II., on the Analysis of the Blood, or at least to show what we wish to ascertain.

I have enumerated about all the properties by which we recognize organic nitrogenized substances, separated from the living organism, as a class; namely, putrefaction, the property of becoming ferments, changes in coction, desiccation, hygrometricity, and coagulation; and all of these depend on the presence of water. Should we not, then, almost conclude from these facts that water is a necessary and very important element of their constitution! It is true that it is separated with great facility, and that its union with the other ingredients is not very powerful; but this is no argument against the fact of its being in a state of positive union. There are many substances in the inorganic world which have a union no more powerful than that of water in organic matters. Take the single example of the bicarbonate of soda. The second equivalent of carbonic acid is driven off by a gentle heat, and even by exposure to the air at the ordinary temperature, leaving the salt in the condition of a carbonate.

There is another circumstance in connection with the mode of union of water with other ingredients to form an organic body which serves to distinguish it from mere solution. When a solid substance, as a salt, is in solution in any fluid, it requires a certain quantity of the fluid to dissolve a certain quantity of the solid, but beyond this the fluid may be increased indefinitely; the solid having the same relation of solution to the whole mass. On the contrary, when one chemical compound, as sulphuric acid, unites with another, as with soda, one equivalent of the one combines with one equivalent of the other, and if more of either one be added, it does not enter into combination. Now I regard the organic substances found in the fluids of the body as naturally fluid, and mixed with the other fluids; the water

which enters into their composition, as represented by the water which they contain when separated from the other fluids by coagulation; and this quantity of water, though not absolutely definite, is as definite in its proportion as the other ingredients. It is restricted within definite limits; and though, when fluid, like many other fluids, it may be mixed with an indefinite quantity of water, when separated by coagulation water will always be found in about the same proportion.

There is another point of view, by far the most important physiologically, from which we must study this question of the natural condition of the organic ingredients of the fluids. Do they conduct themselves in the vital operations of nutrition like the inorganic substances, which are undoubtedly held in solution, or like substances naturally fluid?

This question seems to me very easily answered. The processes of nutrition of the organic elements of the body consist in a change of the fluid organic substances, principally the albumen and fibrin, into those which are semi-solid and solid, like musculine, osteine, etc. In the process of these changes, water is of course absolutely necessary, and is deposited with the other elements of the organic matter. It, as well as the carbon, hydrogen, oxygen, and nitrogen, is necessary to the constitution of the musculine and osteine, and is involved in all the catalytic changes of nutrition.

Having special reference to the blood, and the organic substances which it contains, the relations between this fluid and the tissues constitute one of the most important and interesting of physiological inquiries. In the organic elements of the solids and semi-solids of the body reside, undoubtedly, the vital properties which lead them to regenerate themselves at the expense of the circulating fluid; and in the tissues and organs, as well as the blood, the organic matters are always united with inorganic salts, as well as water. Of these salts, some, in connection with organic matter, go in great measure to make up the tissues, as the phosphate of lime in the bones; while others seem by their presence to regulate somewhat the nutritive processes, like the chloride of sodium, which is more abundant in the blood than in any of the tissues. It is an invariable law that organic nitrogenized principles, whether fluid, semi-solid, or solid, never exist alone, but always in combination with inorganic substances. It is impossible, indeed, in extracting the organic substances from the body, to free them entirely from inorganic salts; and the fibrin and albumen of the blood I have found to contain all of the salts which exist in that fluid. The blood contains all of the elements, both organic and inorganic, which are necessary for the regeneration of the tissues. The inorganic elements are deposited unchanged, and in the organic elements alone resides that property of mutual convertibility which forms musculine, cartilagine, osteine, etc., out of albumen and fibrin. In this process of change we have a deposition of the salts, which cannot take place by itself, but must be involved in the deposition of organic matter. This process is not to be explained by the

laws of chemical attraction, nor represented by a change in chemical formulæ. It is an act which takes place only in organic living bodies, and the more we attempt to elucidate it by investigations of a purely chemical nature, the further we remove ourselves from a comprehension of the essence of nutrition. We must learn to look on processes like this as physiological and not chemical; and as we never have constructed, and perhaps never will construct, a single organic nutritive substance out of its elements, nor changed one into another, so we will ever fail to comprehend the phenomena of change and the mystery of their construction in the body, if we persist in endeavouring to adapt these phenomena to the laws which regulate the composition and changes of inorganic substances. When we study the composition of these substances, we should take them as we find them, and not try to reduce them to a condition approximating that of minerals. The absence of useful results following the labours in this direction of so many chemists should be a warning to us to quit the beaten track. When we study their properties, we have already seen that it is necessary to take them as they are, combined with water, or these properties are lost. When we come finally to study their vital functions in the economy, we find that they not only contain water, but inorganic substances, which are indispensable to the great function of nutrition, and which cannot be separated from the organic. We must in this study recognize the following important facts.

First. Organic nitrogenized substances are the only elements of the body in which reside the properties of destruction and regeneration during life. Fats, sugar, and inorganic salts operate with them, and by virtue of this property, which we may call vital.

Second. They are of indefinite chemical composition; and no physiological importance is to be attached to ultimate analyses. They are unstable; in a state of continual change during life, and soon alter after death, or after being removed from the body.

Third. They assume the consistence of the tissue or fluid in which they exist. They are solid in the solids, like bone; semi-solid in the semi-solids, like muscle; fluid in the fluids, like the blood. They are not dissolved in water, but water is an ingredient, and its quantity determines their consistence.

Fourth. In the body they never exist alone, but always combined with inorganic substances, which accompany them in the changes they undergo in the processes of nutrition and destructive assimilation.

Fifth. As all the proximate analyses of the organized fluids, particularly the blood, have been made with the idea that the organic ingredients were solids in solution in water, these quantitative analyses give, not the proportion of fibrin or albumen, but dried fibrin and albumen, the original substance subjected to a process which drives off its most important constituent, and which alters its properties. Such analyses, as representing real quantities, are erroneous.

PART II. *Analysis of the Blood with special reference to its Organic Constituents.*—From the review we have given of the organic constituents of the body, and the intimate relation we have seen to exist between the tissues and the blood, it becomes evident that an analysis of this great nutritive fluid, especially with reference to its organic constituents, is of the highest interest and importance. This fact has long been recognized, and of late years a great part of the labours of investigators in physiological chemistry have been devoted to this subject. It is not my purpose here to consider any but the organic principles of the blood. The constitution of this fluid, in its entire physiological and pathological relations, is too extended a theme to be considered in this place. The fact that the blood contains certain excrementitious substances shows that this fluid is connected with the waste as well as the repair of the system. The pathological importance of this has been settled experimentally by the discovery of the accumulation of these excrementitious elements in the circulating fluid, giving rise to certain pathological conditions; as, for example, the urea, producing a condition of the system known under the name of uremia; and more lately, the discovery of the character of cholesterine as an excretion and its accumulation in the blood, under certain conditions of the liver, constituting cholesteremia.[1] These are only two examples where diseased conditions of the system have been clearly shown to depend upon the accumulation of a specific excrementitious substance in the blood, acting as a poison; but the work in this direction is but begun; and I venture to predict that more light will be thrown on pathology by the discovery of new poisons in the blood, dependent on defective excretion, than by any other line of experimental inquiry. There are already some known excrementitious substances, creatine and creatinine, for example, of the pathological relations of which we are entirely ignorant; and we must look to these and other elements of this class, which may be discovered hereafter, for light on the pathology of many diseases now obscure.

The proximate analyses of the blood up to this time, have been made under the supposition that the organic matters, fibrin and albumen, were solid elements in solution; but according to the views advanced in Part I, namely, that their real condition is one of fluidity, and that when deprived of water they lose one of their most important ingredients, this mode of analysis is inadmissible. The real quantities of fibrin and albumen can no more be represented by the residue of evaporation, than by the residue of calcination, which would leave only inorganic matter. Before giving, however, the processes by which I have attempted to estimate the quantities of *undried* fibrin, albumen, and globules in the circulating fluid, let us take a rapid review of the methods of proximate analysis which are now generally employed.

[1] See an article on a "New Excretory Function of the Liver," by the author, published in the number of this Journal for October, 1862.

Berzelius, followed soon after by Marcet, gave us the first quantitative analyses of the blood. He analyzed the serum of the human blood, and indicated certain quantities of albumen, lactate of soda, muriate of soda, etc. He put the quantity of dried albumen at 80 parts per 1000, which is about the proportion given in the analyses of chemists of the present day. His researches were published in 1808, and were followed by the analyses of Marcet in 1811, which gave about the same results. In 1823, Provost and Dumas published their researches on the composition of the circulating fluid, with a full account of their process. This process, with slight modifications, is the one employed generally at the present time. The following are the principal steps in the analysis of these eminent investigators: The fibrin is separated from a weighed quantity of blood by whipping with a bundle of broom-corn, carefully collected, dried, and weighed. Another specimen of blood is set aside to coagulate, and after it has fully separated into clot and serum, the clot is dried and weighed; the proportion of fibrin ascertained by the first specimen is subtracted, which gives the quantity of dried globules. The serum is then evaporated to dryness, the residue extracted thoroughly with boiling water, ether, and hot alcohol to remove the inorganic salts and fat, and afterwards weighed, which gives the proportion of albumen. The fats are easily extracted with ether, and the inorganic constituents estimated after incineration, by a process which it is not necessary to describe. Reducing all these results to 1000 parts, we have a table of the constitution of the blood.

This process has been followed, with unimportant modifications, by a number of distinguished chemists, who have done little more, with regard to the albumen and fibrin, than confirm the observations of Provost and Dumas. Among these may be mentioned Andral and Gavarret, Becquerel and Rodier, Sheerer, and Simon. Among these observers, perhaps, the process adopted by Becquerel and Rodier is one as generally accepted by physiologists as any, and I will therefore translate from their excellent work, entitled *Traité de Chimie Pathologique*, so much of it as refers to the estimation of the fibrin, albumen, and globules.

"*First Series of Operations.*—This is designed to furnish: First, the density of the blood and that of the serum; second, the weight of fibrin, globules, and that of the solid matter of the serum taken as a whole. These processes are founded on the same principle which served as the basis of the process devised long since by M. Dumas. We suppose that all the water contained in the blood forms part of the serum, and should be attributed to it. Still, in admitting this principle, we have not always applied it in the same manner.

"The following is our mode of operation:—

"We practise upon the person whose blood we wish to analyze, a bleeding of about 375 grammes.[1] The blood which first flows from the vein is received in a glass vessel, graduated, and capable of holding about

[1] A gramme is a little more than 15 grains.

125 cubic centimetres of this liquid. We collect it and whip it with a bundle of broom-corn. We thus obtain the fibrin, which we must wash, desiccate, and weigh.

"The blood, thus defibrinated, is then put aside to serve for other operations.

"The blood which flows from the vein, after these 125 cubic centimetres, is collected with care in a vessel of the capacity of 250 to 300 cubic centimetres and left to itself. This blood coagulates, and once the coagulation effected, we separate carefully the serum, which we put aside in a vessel; as to the clot, after having taken note of its physical characters, we may set it aside.

"Let us see now what we do; first, with the defibrinated blood; second, with the serum.

"A. The *defibrinated blood* is first weighed at a definite temperature in a glass specific-gravity bottle.[1] We compare then the weight which we obtain in this operation with the weight of the same volume of distilled water; and we thus have, by a very simple calculation which it is useless to reproduce here, the exact weight of the 125 cubic centimetres of blood which we whipped to separate the fibrin, and consequently the weight of this same fibrin contained in 1000 grammes of blood. Once this operation effected, we take a definite quantity of defibrinated blood, which we weigh, which we desiccate, which we afterwards weigh anew, and we thus have the weight of the quantity of water which it contains. Let us take, for example, in order to make ourselves better understood, arbitrary numbers which we will make use of also to deduce the weight of the globules: 100 grammes of defibrinated blood, liquid, gives 20 parts of solid material and 80 parts of water. Then 20 parts, thus dried, are calcinated to give us the inorganic matters; we will return to this.

"B. The *serum*.—After having determined the specific gravity of the serum, we take a given quantity of this liquid which we weigh, which we desiccate, which we afterwards weigh anew; the difference of these two weights gives that of the water; as, for example, 100 grammes of liquid serum having given 10 grammes of solid matter and 90 grammes of water. These operations terminated, we possess the figures necessary to deduce the weight of the globules and that of the solid matters of the serum contained in 100 grammes of defibrinated blood. Indeed, as all the water of the defibrinated blood should be attributed to the serum, we must make the following proportion:—

$$80 : x : : 90 : 10 \text{ or } x = \frac{80 \times 10}{90} = 8.8 \; gr.$$

"This proportion 8.8 represents the sum of the solid matters of the serum contained in 100 grammes of defibrinated blood, and subtracting that from 20, the weight of this blood desiccated, we have 11.2 which represents the weight of the globules, and in calculating the whole to 1000, we have 1000 grammes of blood, containing:—

| | |
|---|---|
| Water . . . . . . . . . . . . | 800 grammes. |
| Globules . . . . . . . . . . . | 112 " |
| Solid matters of the serum . . . . . . | 88 " |

[1] All our specific-gravities were taken at a temperature of 12° (53.6° Fahr.) and compared exactly with distilled water at the same temperature.

"The weight of the fibrin has been given by the first operation, and should be added. Its weight is so small in proportion to 1000 grammes of blood, that we may neglect a little correction which we should have to make for the weight of the fibrin in addition to the 1000 grammes of defibrinated blood.

"Such is the first series of operations; for the second we will make use of the dried serum, and for the third,[1] of the defibrinated blood calcinated.

"*Second Series of Operations.*—These operations are designed to give the weight of the extractive matters and that of the fatty matters. The following is our mode of operation:—

"The serum, having been dried with precaution in an *étuve*, and pulverized with the greatest care, is treated repeatedly with boiling water until this water has completely freed it from everything which it can dissolve. These last are, on the one hand, extractive matters, such as osmazome, the colouring matter of serum, etc. etc., and on the other hand, the salts which are in solution in the serum and are in a free state.

"The serum, thus extracted with water, is dried again and weighed, the difference with the weight obtained by the first weighing indicates that of the matters we have mentioned and which the water has removed. The product of the second desiccation is then treated by boiling alcohol at 90°, until it is completely extracted. The insoluble residue is pure albumen, of which we may take the weight after having dried it. As to the boiling alcohol, it holds in solution all the fatty matters, which can be separated by employing the process indicated by M. F. Boudet, and of which we think it unnecessary to give a description. It gives the seroline, cholesterine, and saponifiable fats."[2]

The above quotation gives a fair representation of the mode of analysis most commonly made use of at the present day. It differs, however, very little from that indicated by Dumas. There are certain objections to this process, aside from those which have reference to the estimation of fibrin and albumen, which have long engaged more or less the attention of physiological chemists and are universally acknowledged to be well founded. It will be observed that all the water is attributed to the plasma while the globules are estimated dry. This is manifestly faulty, as the most cursory microscopic examination of the blood-globules is sufficient to convince any one that they have a consistence dependent upon the presence of a certain quantity of water; and though it may be convenient to estimate these bodies dry, such an estimate gives no idea of their real proportion. This was appreciated as long ago as 1828, by Denis, who attempted to give the proportions of moist globules by a process which had avowedly little accuracy and which he afterwards abandoned for the original process of Dumas.[3] In 1844, Figuier published an analysis of the blood which allows an estimation of the moist globules by a process which I have employed in the analyses which follow, and which seems to me to give

[1] This is to ascertain the proportion of inorganic salts.—A. F., Jr.

[2] Becquerel and Rodier, op. cit., page 21.

[3] Mémoire Sur le Sang. Par P. S. Denis (de Commercy). Paris, 1859, p. 51.

sufficiently accurate results, though Denis does not consider it superior to his own. This process was accepted by Dumas with some modifications which are described by him in the *Annales de Chimie et de Physique* for 1846, p. 452. The process of Figuier depends on the property which certain saline substances have, mixed with the blood, of retaining the globules on a filter. The modification of Dumas is intended to avoid a difficulty which sometimes occurs from alteration and liquefaction of the globules, by which some pass through the filter and are lost. It consists in passing a continuous current of air through the filtering fluid, which prevents this change. In the analyses I have made I have not found it necessary to adopt this precaution.

The following is the process described by Fignier translated from the *Annales de Chimie et de Physique*.[1] It was not used by him to determine the proportion of *moist* globules; the globules are merely separated from the blood, dried, and estimated in this condition like the other organic principles.

"The blood furnished by a venesection is whipped on its discharge from the vein according to the process of M. Dumas. The fibrin separates and adheres to the little broom-corns (*brins de balai*). The liquid is passed through a fine cloth to separate that portion of the fibrin which does not adhere to the broom. This fibrin is then washed in a current of water, then dried in a water-bath, and weighed, after having been treated, if desired, with ether to remove a little fatty matter.

"In taking the total weight of the blood which has given this quantity of fibrin, we will have the proportion of the fibrin to the other elements of blood.

"We then take 80 or 90 grammes only of the defibrinated blood which we treat with about twice its volume of a solution of sulphate of soda marking sixteen to eighteen degrees in the aërometer of Baumé, and this is thrown on a half filter weighed in advance, and previously moistened with the saline solution; with these precautions the serum filters quite rapidly with a yellowish colour.

"We understand that, to remove from the globules that remain on the filter, the solution of sulphate of soda with which they are impregnated, we cannot simply wash the filter, for that would dissolve a portion of the globules and the fluid would pass red like the blood. But a property peculiar to the globules allows us, happily, to surmount this difficulty. When they are heated to 90° (Cent.), as Berzelius has already seen, the globules are coagulated entire, and the entire mass becomes concrete without yielding to the water any of the organic matter. We have only, then, to place the filter in a capsule containing boiling water, repeating this process two or three times. The sulphate of soda is dissolved and the water takes almost nothing from the globules, for the fluid is almost colourless and does not contain any organic matter appreciable by tannin or corrosive sublimate.

[1] Sur une méthode nouvelle pour l'analyse de sang, et sur le constitution chimique des globules sanguins. Par M. L. Figuier. (*Ann. de Chim. et de Phys.*, 1844, 3$^{me}$ série, tome xi. p. 506.)

"To separate the albumen from the filtered serum it suffices to carry it to the point of ebullition in a capsule. The albumen coagulates; it is collected in a little net of fine cloth; it is washed and weighed, after having been dried, by the water-bath. Finally, to determine the quantity of water contained in the blood, we take twenty or twenty-five grammes which we evaporate to dryness in a water-bath. The weight of the residue indicates the properties of water and solid elements.

"The soluble salts of the serum are represented by the difference of the weight of the blood employed and the sum of the albumen, water, fibrin, and globules determined directly."

The above is a very simple and accurate process for determining the globules and organic elements of the blood, but, according to the view we have already taken, is open to the same objection as the other, as it gives the quantity of these ingredients dried, and not as they really exist.

Schmidt, of Dorpat, recognizing the necessity of a proper estimate of the *moist* globules, endeavoured to establish a certain proportion of water to be constantly attributed to them; so that by adding this quantity to the estimate of the dry globules by Provost and Dumas, and others, their results could be made use of. He endeavoured to do this by comparative microscopic measurements of the moist and dry globules, and arrived at the conclusion that the dry globules multiplied by four would give the quantity of moist globules. Though this process was adopted by Lehmann as the most accurate, it is evident that it cannot possibly be exact; especially if the proportion of water in the globules is not always the same, as is stated by Zimmermann.

Zimmermann attempted to give the proportion of water in the globules by estimating the quantity of chlorides in the blood; assuming, with Berzelius, that all the chlorides are contained in the serum and there exist none in the blood. He estimates first the proportion of the chlorides in the serum, then the quantity of chlorides in a given quantity of blood, whence he deduces the proportion of serum in the blood; then subtracting the water contained in the serum from the water contained in the entire blood, he obtains the proportion of water in the globules. As it is by no means certain that the blood-globules contain none of the chlorides, this process cannot be accepted.

Other methods, of a very complicated character, have been proposed by Vierordt, Le Canu, and Lehmann, which it is not necessary to describe, as they present no advantages over the foregoing.

The most recent process which has been proposed originated with Denis, and was published by him in 1859.[1] His manipulations to get rid of the interstitial serum of the globules are complicated and difficult, and of questionable efficacy. He arrives, by this process, at very nearly the results I

[1] Denis, op. cit.

have obtained by the process of Figuier, which, from its simplicity, is much to be preferred.

From this slight review of the processes for the analysis of the blood, especially with reference to the fibrin, albumen, and globules, it is seen that no analysis has ever been made, or even attempted, which would give the real quantities of fibrin and albumen; in all of them the dry residue, and not the substance itself, is given. In the estimation of the globules, however, this desiccating process is so evidently faulty, that efforts have been made to estimate them in their moist state, or as they really exist. As yet there is no one process, for arriving at this end, which is generally accepted by physiological chemists. From my own observations, with regard to all the constituents under consideration, it seems impossible to make an analysis which shall be perfectly accurate; but absolute accuracy is not indispensable; we can get near enough to the truth for all practical purposes, and, as the comparison of different analyses made in the same way gives them much of their value, we should fix upon that process for our estimation of the moist globules which is simplest, and which seems to give the best results. It is manifestly better to get an approximative idea of the fibrin, albumen, and globules of the blood in the condition in which they really exist, than to take the quantity of dry residue, which gives us no idea whatsoever.

Having in view, then, the condition of existence and functions of the organic constituents of the blood, it is only an estimate of these principles in a moist state that can give us any idea of their proportions.

*Analytical Process.*—In the process which I shall describe, I have endeavoured to simplify manipulations as far as is consistent with tolerable accuracy, deeming it important to put such investigations within the reach of every one, rather than complicate the process by precautions which are designed to avoid errors so slight that they may practically be disregarded. Dumas has shown that the composition of the blood is not precisely the same at the beginning and the end of a bleeding, and recommends, therefore, that the blood be drawn in equal quantities in four vessels, defibrinating the specimens in the second and third, and allowing those in the first and fourth to separate into clot and serum. By comparing the results of the separate analyses, a correction may be made. I have not found it necessary to use more than two specimens of two to four ounces each; and with this quantity such a precaution is not necessary.

It is very important to cover the vessels which contain the blood, and weigh them as soon as possible; for the specimens lose weight very rapidly by evaporation, as has been shown by Becquerel and Rodier,[1] which would interfere seriously with the quantitative analysis.

[1] In experiments by Becquerel and Rodier with reference to the loss of weight

The blood to be analyzed is taken from the arm, and received into two carefully weighed vessels. The quantity in each vessel may be from two to four ounces. One of the specimens is now whipped with a small bundle of broom-corn, previously moistened and weighed, so as to collect the fibrin; and after the fibrin is completely coagulated, the whole is carefully weighed, deducting the weights of the vessel and broom-corn, which gives the weight of the specimen of blood used. The other specimen is set aside to coagulate.

The first specimen is to be used for the estimation of the fibrin and globules; and the second is set aside to coagulate, and is used to estimate the albumen.

We now pass the first specimen of blood through a fine sieve to collect any fibrin that may not have become attached to the wisp, strip the fibrin from the wisp, and wash it under a stream of water. This may be done very rapidly if we cause the water to flow through a small strainer, so as to break it up into a number of little streams, and knead the fibrin in the fingers, doing this over a sieve so as to catch any particles that may become detached. In this way it may be freed from the globules in five or ten minutes. The fibrin thus washed is then freed from adherent moisture by bibulous paper, and weighed as soon as possible; and by the following simple formula we estimate the proportion per 1000 parts of blood:—

Weight of blood used : Weight of fibrin : : 1000 : Fibrin per 1000.

The next step is to estimate the globules. For this purpose a portion of the defibrinated blood, which is carefully weighed, is mixed with twice its volume of a saturated solution of sulphate of soda, and thrown upon a filter which has been carefully weighed, moistened with distilled water, and just before receiving the mixture of blood and the sulphate of soda, is moistened with the saline solution. The fluid which passes through should be about the colour of the serum; if a few globules pass at first the fluid should be poured back until it is clear. The funnel is then covered and the fluid allowed to separate, the blood-globules being retained on the filter. The filter and funnel are then plunged several times in a vessel of boiling water, by which all the sulphate of soda which remains is washed out, and the blood-globules are coagulated without changing their weight. The funnel should be covered again, and the water allowed to drip from the filter, after which it is weighed, deducting the weight of the

by evaporation, the following results were obtained. The blood was drawn into a porcelain vessel about two and a half inches in diameter:—

| | Weight of blood on being drawn from the vein. | Weight of blood 2 hours after. | Weight of blood 24 hours after. |
|---|---|---|---|
| 1st Exp. . . | 13.242 grammes | 13.070 grammes | 11.510 grammes |
| 2d Exp. . . | 14.905 " | 14.727 " | 12.977 " |
| 3d Exp. . . | 22.453 " | 22.308 " | 20.337 " |

—*Chimie Pathologique*, page 31.

moist filter previously obtained, which gives us the weight of the globules. We obtain the proportion of globules to 1000 parts of blood by the following formula:—

Defibrinated blood used : Globules :: Defibrinated blood per 1000 : Globules per 1000.

Our next step is to estimate the quantity of albumen in the serum, and thence its proportion in the blood. For this purpose we first ascertain the quantity of serum in 1000 parts of blood, which we do by subtracting the sum of the fibrin and globules per 1000 from 1000. Having done this, and waited ten or twelve hours for specimen No. 2 to separate completely into clot and serum, we take a small quantity of the serum, about half an ounce, carefully weigh it, and add suddenly twice its volume of absolute alcohol. The albumen is thus thrown down in a grumous mass, and the whole is thrown on a filter previously moisted with alcohol and weighed. The funnel is immediately covered, and the fluid separates from the albumen very rapidly. We ascertain that no fluid albumen passes through the filter by testing the fluid with nitric acid. After the filter has ceased to drip, it is weighed, and the weight of albumen ascertained by deducting the weight of the filter. The proportion of albumen to 1000 parts of blood is obtained by the following formula:—

Serum used : Albumen :: Serum per 1000 : Albumen per 1000.

The above process is very simple and easy of application, and if the directions be carefully followed, will give very uniform results. I have repeatedly satisfied myself of this fact by subjecting two specimens of the same blood to the same process, which was followed by almost identical, and in some instances, identical results. For example, in an examination of human blood, two equal quantities (34.20 grammes) of defibrinated blood were analyzed for globules; one specimen gave 16.40 grammes of globules, and the other 16.43 grammes. This part of the process would seem more open to the charge of inaccuracy than any, yet the difference in the results of the two analyses is so slight that it may be disregarded.

In washing the fibrin I was at first led to use a saline solution instead of pure water; but as the mass evidently gained weight treated in this way, I afterwards employed simple water. Of two specimens of fibrin from the same blood, one, which was washed with a solution of common salt, spec. grav. 1010, gave 10.28 parts per 1000, and the other, which was washed with water, gave but 8.82 parts, a diminution of about 14 per cent.

I tried most of the methods for coagulating the albumen before fixing upon the one by absolute alcohol. The object was to get it as near as possible in its natural condition, simply changing its form from fluid to semi-solid, without adding anything which would decompose it or unite with it; and absolute alcohol seemed better than heat, nitric acid, the galvanic current, or any of the agents by which it is coagulated. It is necessary to add about

twice the volume of alcohol, and suddenly, when the fluid which separates by filtration will be found to contain not a trace of albumen. Repeated trials of different specimens of the same serum, producing generally identical results, led me to fix upon this as the best method.

It is easy to see, after a few trials, why the moist method of estimation of these organic matters has not been employed by chemists. The difficulty is to fix the standard of moisture; for the specimens, even when on the balance, lose weight by evaporation every moment. This, of course, shocks the ideas of accuracy which are necessarily ingrafted into the character of every good analytical chemist. One who is accustomed to weigh for hours, perhaps, to avoid a possible error of the thousandth of a gramme, could not consent to accept a weight which is changing every moment. Perfect desiccation is the only absolutely definite standard; and in all these organic animal analyses, the substance is weighed, and exposed to heat, over and over again, till it ceases to lose weight. Though this accuracy is indispensable in some processes in physiological chemistry, here it is not only unnecessary, but impossible. It is part of the nature of these substances to change every moment, and when they are reduced to such a condition that they will no longer change, they have lost all their characteristics as organic principles. What we want is an approximate physiological idea of their real quantity; and this is better than the most accurate estimate of their dry residue.

By the process just described, I have arrived at the following results in the few quantitative analyses of the blood for organic principles which I have been enabled to make. The variations in these constituents in different states of the human system, and in different animals, are interesting and important; but this demands time and a long series of investigations. In the few observations herein presented, it has been my object to show the advantages of the analytical process employed, so that it can be applied by others, and to give merely an analysis of the healthy human blood; and the various experiments have been made rather to be able to fix upon a definite process, than with a view to comparative results. Attention has been directed only to fibrin, albumen, and globules, for reasons which have already been fully explained. As far as the other constituents are concerned, I have not the temerity to suppose that I could improve upon the processes employed by the eminent hematologists to whom I have so often referred in this paper. The number of analyses of human blood is not large, for it is not easy to obtain healthy specimens; and with our improved notions of therapeutics, it is difficult also to obtain specimens of blood from patients. The specimens of human blood were taken from the arm. The blood of the ox was taken in the slaughter house, the vessels of the neck being divided after the animal had been knocked on the head.

*Examination* I. *Human Blood, Male.*—This specimen of blood is assumed to be perfectly normal. The subject was 27 years of age, male,

perfectly healthy, and had never suffered from disease. Weight, 170 pounds. The blood was taken from the arm at 1 P. M. The last meal had been taken at 8 A. M.

The following is the result of analysis of the blood:—

| | | |
|---|---|---|
| Fibrin . . . . . . . . | 8.82 | parts per 1000. |
| Albumen . . . . . . . . | 329.82 | " " |
| Globules . . . . . . . . | 495.59 | " " |

*Examination* II. *Human Blood, Male.*—This specimen was taken from a man, 37 years of age, calker by trade, weight 200 pounds, but rather corpulent than muscular. He had slight constitutional syphilis, and had been taking the iodide of potassium, gr. x three times a day, for about three weeks. He was bled from the radial vein about two hours after dinner.

The following is the result of analysis of the blood:—

| | | |
|---|---|---|
| Fibrin . . . . . . . . | 7.44 | parts per 1000. |
| Albumen . . . . . . . . | 277.55 | " " |
| Globules . . . . . . . . | 480.44 | " " |

*Examination* III. *Human Blood, Female.*—This specimen was taken from a female, 27 years of age, weight 160 pounds, dark complexion, and perfectly healthy, with the exception of a slight plethoric tendency, as indicated by occasional epistaxis which had troubled her for a few days. She menstruated regularly, the last time about two weeks before. She took lunch about 11 A. M., and was bled at 2 P. M. The blood coagulated rapidly, and in twelve hours the clot presented the "buffed and cupped" appearance in a marked degree. A portion of the defibrinated blood which was not used in the analysis presented a remarkable example of gravitation of the globules and separation from the serum. It stood in a graduated glass, and the upper half, by measurement, consisted of pure serum. The whole fluid was f℥xii⅔, and the globules marked f℥vi⅓.[1] Two days after the venesection the woman still enjoyed perfect health.

The following is the result of analysis of the blood:—

| | | |
|---|---|---|
| Fibrin . . . . . . . . | 16.81 | parts per 1000. |
| Albumen . . . . . . . . | 311.18 | " " |
| Globules . . . . . . . . | 484.51 | " " |

*Examination* IV. *Human Blood, Female.*—This specimen was taken from a woman, 28 years of age, of somewhat anæmic aspect. She had been taking ℥j of sulphate of magnesia every second day for two weeks.

[1] This tendency of the globules to gravitate in defibrinated blood was noticed by Poiseuille, and is mentioned by Bernard, who advances the view that one of the important functions of fibrin is to keep the globules in uniform suspension. (Bernard, *Liquides de l'Organisme*, tome i. p. 465.) The phenomenon is by no means invariable. I have seen specimens of blood in which there was no gravitation of the globules. Such a complete separation as was presented in this specimen of blood is very remarkable.

The medicine usually operated three or four times. She was bled at 2 P. M., having eaten nothing since 8 A. M.

The following is the result of analysis of the blood :—

| | | |
|---|---|---|
| Fibrin | 11.34 | parts per 1000. |
| Albumen | 219.47 | " " |
| Globules | 382.95 | " " |

*Examination* V. *Blood of the Ox.*—This specimen was taken from a small ox, the throat being cut after he had been knocked in the head.

The following is the result of the analysis:—

| | | |
|---|---|---|
| Fibrin | 14.52 | parts per 1000. |
| Albumen | 195.24 | " " |
| Globules | 623.36 | " " |

*Examination* VI. *Blood of the Ox.*—The animal from which this specimen was taken was rather larger and more vigorous than the one which furnished the blood in Exam. V.

The following is the result of the analysis:—

| | | |
|---|---|---|
| Fibrin | 16.27 | parts per 1000. |
| Albumen | 200.85 | " " |
| Globules | 568.61 | " " |

Of the four observations on the human subject, but one, Exam. I., can be taken as a fair example of normal blood. This analysis shows that the moist globules constitute about one-half of the entire mass of blood; an estimate which does not differ very considerably from the results obtained by others who have endeavoured to solve this question. Denis gives the proportion of globules in a person "30 years of age, strong constitution, sanguine temperament," 489.52 parts per 1000.[1] Schmidt estimates the moist globules at 513 per 1000 for the male and 396 for the female.[2] Lehmann estimates them at 496 per 1000.[3]

The albumen constitutes by far the greater part of the other organic matter, and forms nearly one-third of the entire weight of blood. As this is undoubtedly the element which nourishes the organic parts of the tissues, which form the greater part of the body, we are not surprised at its preponderance. The fibrin we see, even by this mode of analysis, exists in small quantity; sufficient, however, to firmly coagulate the whole mass of blood. One is surprised in washing a large clot to see how little fibrin is necessary to thus entangle all the globules. The salts were found to exist in the fibrin, albumen, and globules, which were all tested for chlorides, carbonates, phosphates, and sulphates.

Taking Becquerel and Rodier as authority for the proportion of fatty,

[1] Denis, Mémoire sur le Sang., Paris, 1859, p. 427.

[2] Milne Edwards, Leçons de Physiologie, &c., tom. i. p. 237.

[3] Lehmann, Physiological Chemistry, American edition, vol. i. p. 548.

inorganic, and extractive matter, the following table represents the composition of the blood in a healthy adult male.

COMPOSITION OF THE BLOOD.[1]

| | | |
|---|---|---|
| | Globules | 495.59 |
| Plasma. | Water | 155.42 |
| | Fibrin | 8.82 |
| | Albumen | 329.82 |
| | Fats, inorganic salts, and extractives (B. & R.) | 10.35 |
| | | 1,000.00 |

We have not yet sufficient data to arrive at any definite conclusions with regard to the variations of the organic constituents of the blood, as regards sex, conditions of the system, and in different animals, which, indeed, would be beyond the scope of this paper; but the few facts we have collected go to confirm some of the observations which have already been made upon these points. It has been often observed that the blood of the ox is much richer in fibrin than that of the human subject, the former containing from 5 to 6 parts per 1000 dry, while the latter contains but from 2 to 3. This difference is shown in the preceding analysis, where the blood of the ox is found to contain 14.52 to 16.27 parts of moist fibrin, human blood containing but 8.82 parts. The analysis also shows a greater quantity of fibrin in the two specimens of blood of the female than in the blood of the male. In the observations of others the quantity has not been found to vary much in the sexes. In this instance neither of the specimens from the female could be taken as perfectly normal; as in Examination III. the subject was plethoric, and in Examination IV. she had been taking sulphate of magnesia, and was somewhat anæmic.

The albumen was found to vary considerably in the specimens of human blood, being more abundant in the blood of the male in Examination I. than the female in Examination III. and IV., but less in the blood of the male in Examination II. than in the female in Examination III. There are not here sufficient data to form any conclusion with regard to the variations of albumen in the sexes. In the blood of the ox, the albumen was much less than in human blood.

The quantity of globules was found to be greater in the male than in the female. This has been noticed by all observers who have directed their

[1] In order to ascertain whether this specimen of blood contained what would be considered the normal quantity of organic constituents estimated by the old method, these were evaporated to dryness and weighed carefully, with the following result, which it will be seen corresponds with that generally obtained :—

| | | |
|---|---|---|
| Fibrin | 2.50 | parts per 1000. |
| Albumen | 71.53 | " " |
| Globules | 125.00 | " " |

The proportion of albumen to the serum was 82.07.

attention to this subject, and is, perhaps, one of the most characteristic differences between the blood of the male and of the female. One of the females was slightly plethoric, which caused the globules to mount up nearly to the standard of the healthy male. This condition of plethora, according to Andral, is dependent almost entirely upon an increase in the globules. The difference in this respect between the blood of the female who was slightly plethoric, and the other, who was somewhat anæmic, is very marked; in the former the globules are 484.51 and in the latter 382.95. The blood of the ox was found to be very rich in globules.

In conclusion, I beg leave to state that I have not attempted in this paper to settle the normal constitution of the blood, much less to follow out the variations to which it is subject. This would require a largely extended series of observation. But, considering a proper idea of the condition of existence of the organic ingredients of immense importance to the physiologist and physician, I have endeavoured to study this fluid from a physiological point of view; and, with the ideas I have been led to entertain on this subject, it seemed that a new mode of analysis was indispensable, which would give us the real proportions of these principles. My object has been merely to settle upon some rational and simple process, leaving its extended applications to be made in the future. The process I have described seems to me sufficiently accurate for all practical purposes; and is so easy of application, that I cannot but indulge the hope that many may be led to cultivate this interesting and fruitful field of inquiry.

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ART. V.—*Conservative Medicine as Applied to Hygiene.* By AUSTIN FLINT, M. D., Professor of the Principles and Practice of Medicine in the Bellevue Hospital Medical College, and in the Long Island College Hospital.

As the phrase *Conservative Medicine* may be misconstrued, a brief explanation is to be premised. The term Conservatism may be used to express a principle which leads the practitioner, in dealing with diseases, to preserve, develop, and support the vital powers. The unfolding of this principle more and more during the last quarter of a century, has been a result of the progressive increase of the knowledge of the organism in health and disease, together with the accumulating fruits of clinical experience; it is the characteristic of the therapeutics of the present time, as represented by the views of the ablest writers and practitioners, and it is claimed that it should be considered as the governing principle in medical practice. For a fuller exposition, the reader is referred to the previous articles on the subject.[1]

[1] *Vide* Am. Journ. of Med. Sciences, No. for January, 1863.

The subject of conservative medicine in the articles just referred to, has been considered chiefly as regards its therapeutical relations. The purpose of this article is to consider the subject in its relations to *Hygiene*. Here, as heretofore, the largeness of the subject is such that the writer can only aim, within the limits of a single article, to present a few desultory thoughts which may be suggestive, in the minds of his readers, of trains of reflection leading to important practical conclusions.

Hygiene enters alike into the prevention and management of diseases. The name suggests more especially measures concerned in the preservation of health; but, in therapeutics, all measures, not medicinal, may be distinguished as hygienic. I shall use the term with this breadth of application. And it will be a natural division of the subject to direct attention, *first*, to hygiene in health, and, *second*, to hygiene in disease. I will adopt this arrangement.

*Conservatism, as applied to hygiene in health.*—There is no need to argue for the validity of the principle of conservatism as applied to the preservation of health. Hygiene, in this application, can, of course, have no object which does not assume to be conservative. To weaken the powers of life, or impair the constitutional strength, is never the design of measures to prevent disease. The violations of the principle which fall within this division of the subject proceed either from ignorance, or false notions as regards the effects of means supposed to be conservative. Violations of the principle are less frequent and marked now than formerly; the progress of conservative medicine is shown in its prophylactic, as well as its therapeutical relations; still, examples of not only past, but present non-conservative errors are not wanting.

It is not many years since the notion was prevalent, both within and without the profession, that there is such a condition as an overplus of health. And it was the custom to resort to potent measures to reduce the exuberance of health within safe limits. Bleeding and purging were employed for this end. There are persons now living who were accustomed, in their young days, to get bled from time to time purely as a sanitary measure. Nothing was more common, a quarter of a century ago, than for healthy persons to apply at the offices of physicians for a venesection, which was performed, as a matter of course, on the judgment of the applicants. Such occurrences are very rare at the present time. Purgation, being practicable without the aid of the doctor, was almost universally employed as a health-preserving duty. Cathartics were regarded as cleansing agents, and not less important for the alimentary canal, than soap for the surface of the body. An occasional internal "scouring" was supposed to be even of greater importance than a thorough external scrubbing, for while the latter was enforced chiefly on the score of cleanliness, the former had the additional recommendation of being thought to be essential to the welfare of the system. There are many now in middle life, with whose

reminiscences of childhood are associated periodical doses of sulphur and cremor tartar mixed with molasses, given regularly for a series of days, before breakfast, or at bedtime, especially at every recurrence of the vernal season. This was the cleansing mixture for healthy persons of tender age. After this period, the so-called cooling purgatives, such as the Glauber and Epsom salts, had preference. A person with an excess of health was considered to be on the threshold of disease, and the latter was supposed to be warded off by the timely employment of the lowering, cleansing, and cooling measures just referred to. The popular use of purgatives or prophylactic agents, is still sufficiently common.

Gestation is a physiological, not a pathological, state; and, since it is by no means a modern discovery that all the needful supplies for the development and growth of the fœtus are contained in the maternal blood, a common-sense view of the matter, it would seem, should have led to the conclusion heretofore, as now, that pregnant women cannot well afford to lose blood; yet, a few years ago, pregnancy was supposed, as a matter of course, to call for repeated blood-lettings. The physician who declined to bleed a healthy person desirous of losing blood simply on the score of pregnancy, had often a task in trying to remove the disappointment which his refusal occasioned. Venesection, under these circumstances, was deemed an important sanitary measure. How such an absurd notion arose, I will not stop fully to explain. Briefly, it was a result of theoretical views respecting inflammation, views which led to the conclusion that the great source of danger, as regards the development of disease, was a redundancy of the vital fluid. How different the practical views of the present time, based on the belief that paucity and impoverishment of the blood are conditions often giving rise to, and standing in the way of recovery from, a variety of diseases!

As another example of the violation of conservatism, may be cited the custom with many surgeons, formerly, to prepare the system for important operations by lowering the powers of life. For this end, a course of purgatives, a system of reduced diet, and sometimes a venesection, were deemed important. This custom does not seem to be entirely exploded at the present time. In like manner, if there were good grounds to expect the speedy occurrence of any disease, as, after exposure to contagious fevers, during the period of incubation, a similar plan of impairing health, by way of preparation for the disease, was considered to be a prudential measure.

Now it may be laid down as a rule of prophylaxis, that, other things being equal, disease is less liable to occur in proportion as the health is perfect and the vital powers high in the scale of strength. This rule may not invariably hold good. Some of the special causes of disease, among those styled zymotic, appear sometimes to luxuriate in vigorous organisms; but if there are exceptions, they do not subvert the rule. If this be true,

it is a correlative truth that everything which impairs health or depresses the vital powers, favours the occurrence of disease. Observation and common sense warrant the adoption of the latter truth as a maxim of conservative medicine. Akin to the foregoing rule is another, viz., the system is prepared to endure and recover from disease in proportion to the previous completeness of health and the degree of constitutional vigour. Without having the statistical data to demonstrate this rule, and without denying the possibility of exceptions, observation and common sense warrant its adoption as a maxim of conservative medicine. Let us, then, inquire whether among the existing notions or customs having reference to hygiene in health, there be not some which are inconsistent with the foregoing conservative maxims. I do not mean to inquire concerning those palpable violations of the laws of health, which every reflecting person recognizes as such, and which are common enough. My proposed inquiry relates to false views respecting the means of preserving health or warding off disease; in other words, instances in which persons suppose they are doing right when, in fact, they are doing wrong. It will not be difficult to find examples of this kind.

The wear and tear incident to untiring activity in the pursuits of life first suggests itself. In this country the evils springing from false notions and customs, relating to the exercise of the mental and physical faculties, are enormous. A young man enters upon active life, with injunctions to push his industry to the utmost limit of his capacity of endurance; he is incited to constant exertion by the examples of others; he is stimulated by his ambitious aspirations or a conscientious desire not to be wanting in the discharge of his duties; his position and responsibilities, in the existing state of society, may seem to render excessive and unremitted assiduity imperative. He may, or may not, violate the laws of health in other respects. If he be regular in his habits, temperate and moral, he is encouraged on every side by approving friends; he is held up as a model for imitation; he looks upon himself with self-complacency; and yet, he is advancing steadily onward, perhaps, to the accomplishment of the great objects in life before him, but with greater certainty to a condition of impaired health, with the mind weakened or disordered, and a proclivity to any disease to which there may be a predisposition. All physicians, especially those who practise in cities and large towns, well know that there is a class of patients who suffer from the want of health, without having any disease which has a place in the nosology. The morbid state in these cases has been gradually induced, and many suffer without appreciating the fact that their state is morbid, and, therefore, without making application for medical aid. They feel a deficiency of their accustomed energy and buoyancy, their interest in persons and things flags, their appetite fails, they lose strength, and they are depressed, without any apparent reason, or, by causes which, in a condition of health, would disturb the

mind very little. These are the early effects of wear and tear, due to overtasking, not the physical powers alone, but, conjunctively, the mental faculties. Of the cases of chronic diseases, such as tuberculosis, Bright's disease, diabetes, etc., how large is the proportion in which the previous history shows the existence of wear and tear for a greater or less period prior to the development of the affection? This would be an interesting point for statistical research, but we need not wait for the results of statistics to know that the proportion is large. And, of the cases of acute diseases developed in persons suffering from wear and tear, how much of the fatality is due to the diminished power of resistance incident to the antecedent morbid state! How many would probably escape the development of acute disease were it not for this morbid state!

These considerations, while they are of vast importance, should not militate against a proper degree of attention to the objects in life. They do not show that either physical or mental activity is unfavourable to health. The reverse of this is undoubtedly true. As regards the mind, it is not the intensity of the exercise of the faculties which involves wear and tear. It is the long-continued, unrelaxed efforts, accompanied by unceasing anxiety and strain, which tell upon the system. The physician, oppressed by the weight of his professional cares, is well aware that it is not the demand for the operations of the intellect which bears heavily upon him, so much as the pressure of the sense of responsibility inseparable from his duties. It is not the frequency or force with which the bow is bent, but the constant tension, which destroys its elasticity and renders it worthless. Unremitted exercise of the mental and physical powers, although they are not overtaxed, cannot be indefinitely borne; sooner or later the system will break down. Here is a truth difficult to appreciate in its personal application; but every one recognizes it in its application to the physical endurance of inferior animals. A horse, never overworked, and in all respects well cared for, after a time must be turned out to grass. The prudent owner sees this clearly enough, and acts accordingly, while he fails to see that what is true of his horse is not less true of himself. Many persons pursue a course with respect to themselves which they could not pursue, without remorse, toward a beast of burden. It appears to be a part of the egotism inherent in some persons to think that they are so constituted as to bear an unlimited duration of steady work. Next to this is the folly of supposing that the powers of the system, when they give way, may be restored by medication. And when, at length, they find that they are not exempt from the laws pertaining to all animal, as well as human bodies, they perhaps discover, too late, that the influence of habit has rendered continuance of labour essential to happiness. Fortunate are they who, without sacrificing aught that belongs to a proper degree of assiduity in pursuing the objects of life, have taken care to preserve the capacity for healthful recreation!

It is a curious notion, which physicians sometimes inadvertently sanction, that mental and physical exertions are compensatory as regards each other. The man who is overworking the brain, seeks to make amends by fatiguing the muscles. It has occurred to me repeatedly to meet with persons who were devoting too large a number of hours daily to labour of the mind, and who imagined that this may be done with impunity provided a certain amount of muscular exercise be added. A lawyer, for example, who habitually devoted ten or twelve hours a day to intense intellectual occupation, became sensible that he was tasking unduly his mental powers, and, in order to fortify his health, moved out of town, and managed to ride on horseback from ten to twenty miles each day. Under the combined effects of the exercise of mind and body, as might be expected, he was losing ground rapidly. It is clear that exhausting mental labours will be longest borne in proportion as the time not thus occupied is devoted to physical, as well as mental, repose; and, on the other hand, that too much physical labour will be less hurtful in proportion as it is not conjoined with activity of mind.

Violations of conservatism, hardly less flagrant, in the hygiene of health, relate to diet. Both the profession and public have been sufficiently alive to the subject of gluttony. The evils of over-feeding, as regards the production of disease, have undoubtedly been exaggerated. The injurious effects of gormandizing habits are mental and moral, rather than physical. So far as health and prophylaxis are concerned, false notions in an opposite direction have been productive of more harm. A quarter of a century ago, dietetic abstemiousness was considered to be the alpha and omega of hygiene. The world was eating too much; hence, the ills that flesh is heir to. So believed, not only physicians, but the non-medical health philosophers. The great conditions of health were supposed by many to be the minimum quantity of food with which life could be supported, as little variety in the articles of diet as possible, coarseness in quality, and rejection of most of the accessory aliments. Some advised, as a security against errors of quantity, to regulate each meal by weight.

Vegetarianism had not a few apostles and disciples. We have heard a transcendental reformer contend that in assimilating meat the natural characteristics of the animals were necessarily appropriated; that is, pork communicated to man the attributes of swine, and so of beef, mutton, veal, etc. All the refinements of the art of cooking were deprecated as tempting to over-indulgence.

The sense of taste was deemed a fallacious guide in the selection of articles of diet, and the appetite was so unsafe as a criterion of sufficiency, that the injunction was always to rise from the table hungry.

It was considered a wise course to watch carefully the progress of digestion, so as to ascertain after every meal whether any imprudence had been committed. The subject of dietetics was discussed, not only in medi-

cal writings and in intercourse with physicians, but it entered largely into popular literature; it not only pervaded table-talk, but ranked next to the weather in common conversation; public lecturers made no small account of it, and it was not overlooked in the pulpit. In short, the zeal in behalf of abstemiousness in diet amounted to fanaticism. And dyspepsia was the most common of all ailments among the intelligent and cultivated classes, while it was rare among those who, without thinking of dietetics or digestion, satisfied the appetite with the food placed before them. There is reason to believe that the fanatical notions just referred to, not only contributed to the prevalence of dyspeptic disorders, but favoured, in no small degree, the development of other and graver affections, by impairing health and lowering the vital powers.

These notions are by no means yet obsolete either within or without the profession. There are many now who fancy they promote the welfare of body and mind by habits of diet which are incompatible with the highest degree of mental and physical vigour. There are physicians who sanction such violations of the hygienics of health. It is still considered by not a few to be gross and unrefined to eat heartily. Especially with the other sex, it is deemed a lady-like accomplishment to have a delicate appetite, and abstain from the more substantial articles of food. There are fashionable boarding-schools where, as a part of the educational discipline, girls are placed under dietetic restrictions which, in a measure, explain the imperfect development, the anæmia and feebleness of constitution of those who are preparing to become wives and mothers. It is not yet sufficiently appreciated by all, that the *mens sana in corpore sano* is best secured by nutritious supplies abundant and varied; that the healthiest, ablest, and best men and women have been good feeders; that an excess of ingesta over the absolute wants of the economy is not necessarily an evil, there being provisions made for the disposition of an overplus, but none against a deficiency of aliment; that generous living, constituting an important part of the management of certain diseases, *e. g.*, pulmonary tuberculosis, must be also important in preventing their development; that hunger, appetite, and taste were designed to govern dietetics, and are adequate to their office; and that personal experience derived from watching the progress of digestion, is extremely fallacious. There is still, therefore, scope for the progress of conservatism in this direction, in order to meet the requirements of existing knowledge and of common sense.

With these few remarks on conservatism as applied to hygiene in health, I pass to the second division of the subject.

*Conservatism as applied to hygiene in disease.*—The importance of the hygienic management of diseases has not been, and is not, adequately estimated, for two reasons: *First*, because hygiene in its relations to health has been imperfectly understood and is not sufficiently appreciated; and, *Second*, too great reliance has been placed on medicinal measures of treat-

ment. It is only within late years that the profession has begun to be awake to the vast importance of the study of the laws of health. Sanitary science is yet in its infancy, and claims far more interest and attention than it now receives. The main dependence, hitherto, in the management of diseases, has been on the curative influence of remedies. That many diseases, under favourable hygienic circumstances, intrinsically tend to recovery, is a fact but recently known and still too little considered. The mind of the physician is too often engrossed with the inquiry, "What drugs shall I give to effect a cure?" and, hence, he frequently loses sight of another inquiry, often of far greater consequence, viz., "What hygienic regulations will contribute to the recovery of the patient?"

This division of my subject has diverse relations. In one aspect it relates to the various hygienic circumstances embraced under the heads of diet and regimen; the latter comprehending influences affecting not only the physical but the mental and moral being. In another point of view, it relates to different diseases, the different stages of disease, and the numerous circumstances which are incidental to disease. I cannot undertake to treat of this more than the former division of the subject with any approach to completeness, or in a systematic manner. I shall only offer a few desultory thoughts, and I will consider first the topic which was last considered in the former division, viz., *diet*.

A striking improvement in the practice of medicine, of late years, relates to diet. Physicians have learned to appreciate, more than formerly, the value of supporting treatment in fevers and other acute diseases, and to regard alimentation as an essential part of this treatment. They have also learned that it is a great object in various disorders and chronic affections to build up the powers of the system, and that this is to be done by conjoining with other measures nutritious food. Has improvement in this direction reached its limit? Is the extent to which alimentation should enter into the management of diseases, fully appreciated? Let us see if there be not ground for answering these questions in the negative.

Limiting attention to acute diseases, it is now generally understood that they do not stand in the way of dying from starvation. Graves uttered a literal fact when he said that patients with continued fever, treated without nourishment, may be starved to death. And this fact is equally applicable to other acute diseases. That a fatal result may take place, and not infrequently has taken place, not from an existing acute disease *per se*, but from inanition, will not be denied. Now it is only an extension of this fact to say that more or less of the morbid phenomena pertaining to the progress of acute diseases are due to a suspension or impairment of the processes involved in nutrition. If patients affected with acute diseases may die from inanition, the latter must play an important part in the production of the phenomena manifested in connection with the diseases; and this must be true of cases which end in recovery as

well as of those which terminate fatally. Deficiency of assimilation originates the symptomatic phenomena, in acute diseases, to a greater or less extent, and here is a source of danger in a greater or less degree. In other words, the symptoms which represent the condition of a patient affected with an acute disease, spring, in part, directly from the disease, and partly from the want of appropriation of fresh supplies for nutrition. Innutrition, in a pathogenetic point of view, has not been sufficiently considered. There is reason to believe that it forms a constant, and often a very important element of all acute diseases; and the practical bearing of this fact is of great importance.

It is fair to assume that the effects produced in a healthy person by withholding food, may also result from the want of nourishment in disease. If starvation be not less fatal in the latter case than in the former, the morbid phenomena, it may be reasonably supposed, are essentially the same in both cases. In order, therefore, to judge of the extent to which the symptoms of disease are attributable to innutrition, the clinical study of starvation in health is important. Experimental observations in inferior animals are not altogether satisfactory in consequence of the difficulty of appreciating certain symptoms. Nor are the instances of human beings starved from necessity, as in shipwreck, suited to the purpose, because the effects of the want of food are mixed with the moral influences incident to their situation, and, moreover, in such instances, generally, there is a deprivation of water as well as food. Experiments voluntarily made are to be preferred; and of these the best to which I am able to refer are those made by Hammond, to establish the relative nutritive value of albumen, starch, and gum.[1] Subjecting himself to the trial of restricting his diet to these alimentary principles singly, Hammond found that they were incapable of supplying the wants of the system, and that the two latter were absolutely innutritious. During each experiment certain phenomena were produced. Now, these phenomena, for the most part, certainly were not produced by the alimentary principle taken, but resulted from the absence of other alimentary principles, or in other words, from innutrition. These experiments, therefore, may be taken as illustrative of the morbid effects of starvation, effects occurring in disease as well as in health. In this point of view they are not only interesting, but of great value. Referring the reader to the essay for fuller details, I will simply mention the symptoms entering into the concise descriptions by the experimenter.

1. Under a diet consisting of pure albumen for ten days: Febrile movements, heat and dryness of skin, headache, loss of appetite, nausea, abdominal pains, progressively increasing debility, serous diarrhœa, want of sleep.

[1] *Vide* Physiological Memoirs, by Wm. A. Hammond, M. D., Surgeon-General U. S. Army, etc., 1863.

2. Under a diet of pure starch for ten days: Debility, disturbed sleep, sense of oppression of chest, palpitation, headache, slight scratches of the skin showing tendency to inflammation and suppuration, febrile movement, abdominal pains.

3. Under a diet of gum, which he was able to continue only for four days: Abdominal pains, disturbed sleep, headache, febrile movement, diarrhœa.[1]

Can it be doubted that these symptoms occur under similar conditions as regards diet, in the course of disease? And, if so, how often are these symptoms, presenting themselves in the course of disease, referable, measurably or entirely, to innutrition? I cannot dwell upon these inquiries. I must leave them, reiterating the belief that, while under erroneous views, physicians have been accustomed to regard the ingestion of nutritious food during the course of acute diseases as fraught with evil results, more or less of the morbid phenomena supposed to belong directly and exclusively to the existing disease, proceed from defective assimilation.

The practical conclusion based on the statement just made is obvious. It is an object in the management of acute diseases not to withhold nutriment, but to promote the assimilation of nutritious supplies. In many diseases this is *the* great object in the management, taking precedence of any known curative remedies. The object always exists, but the extent to which it can be accomplished varies according to the nature and seat of the disease, together with a host of incidental circumstances. The object is the basis of a principle which may be laid down as applicable to the treatment of all acute diseases, viz., alimentation is important to the fullest practicable extent. It is always desirable for a patient affected with any acute disease to take as much food, embracing a proper variety of alimentary principles, as will be appropriated. Inconvenience and evil results may doubtless follow the ingestion of aliment beyond the powers of digestion and assimilation; but the risk of injury from this source, with the exercise of a fair amount of prudence, is less than the liability of harm if, from an excess of caution, the patient suffer from starvation. The minds of physicians have been too exclusively directed to the harm which may possibly be done by overfeeding in acute diseases, and they have overlooked the greater harm of failing to furnish supplies which may be digested and assimilated notwithstanding the existence of disease.

A wide field is opened up by the practical application of this principle. It involves the encouragement of a desire for food instead of the dis-

[1] For a full account of the effects of starvation on the different organs and functions, and for references to the literature of this subject, the reader is referred to the *Cours de Physiologie*, par P. Bérard, tome premier, pages 517 *et seq.* The following quotation, by this author, from Chossat, embraces a fact which has been to a great extent overlooked: "*L'inanition est une cause de mort qui marche de front et en silence avec toute maladie dans laquelle l'alimentation n'est pas à l'état normal.*"

couragement caused by needless apprehensions. The desire for food may often be developed by judicious contrivances; the appetite may be fostered, on the one hand, or, on the other hand, destroyed by circumstances connected with the selection, preparation, and administration of articles of diet. Giving medicines too frequently, and the use of nauseous or nauseating remedies, may do harm by compromising the desire for food and appetite, which their remedial effects will not compensate for. The mental condition may conflict with a disposition to take food, when, if taken, it will be digested and assimilated; this is true of the continued fevers, and other diseases accompanied by a typhoid state. In such cases food is to be given without regard to the desire or appetite; the condition of the digestive organs, and the results of experience from day to day, are of course to be considered. These are some of the numerous circumstances affecting alimentation as a measure of management in acute diseases. I must content myself with this allusion to them. But in passing from this topic, a word or two with regard to the diet of hospitals. This is generally determined by the supposed wants of the system, without much reference to the choice or wishes of the patient. How much good might be done by selecting, preparing, and serving food to hospital patients with a view, not alone to the requisite amount and variety of nutritive material, but to develop, encourage, and satisfy desire and appetite! I have often thought if I had unlimited control of the culinary department of a hospital, I would willingly submit to a proportionate curtailment of the articles pertaining to the dispensary.

I cannot find space even to touch upon the various practical points pertaining to the kinds of food suited to the diverse circumstances incident to different diseases; and I will only add, lest some of my readers may imagine what I have written on the dietetic management of acute diseases to be purely speculative, that the views now presented are based not only on reasoning believed to be sound, but on considerable experience. This experience would have been larger were it not that traditional ideas fixed in the public mind, as well as still prevailing in the profession, render it difficult often to carry out an efficient plan of alimentation in private practice; and in hospitals this part of the treatment is limited by circumstances which the physician cannot control. Prejudices, professional and popular, against air and water in the management of acute diseases, prevailed until within a recent period, and are by no means now obsolete. The antipathy to feeding patients will in time appear as absurd as to deny drink and disregard ventilation.

The foregoing remarks have had reference to diet in acute diseases. The importance of ample alimentation in chronic affections is better appreciated, but there is room here for further improvement. I shall content myself here with a maxim of conservative medicine, quoted from my first essay on this subject: "Under all circumstances, a chronic affection is less likely to

be prolonged, serious lesions of structure are less likely to take place, and a fatal termination is postponed in proportion as the vital powers are preserved." I need not stop to argue that the vital powers are to be preserved by a nutritious diet conjoined with other hygienic measures.

I have just now alluded to *air* as an element of hygiene in disease. Of the various hygienic conditions, perhaps, to none has attention been more directed, of late years, than a sufficiency of breathing space and adequate ventilation. There is room, however, for the inquiry whether improvement here has reached its limit. Granting the largest estimate of cubic feet, and the best contrivances for the renewal of the air of the ward or sick-room, there is reason to think that additional influences pertaining to the atmosphere may be brought to bear with advantage on the management of diseases. During the present civil war in this country it has been repeatedly observed that the wounded have done better in the open air, exposed to deprivations and vicissitudes of weather, than after having been received into houses or hospitals, containing every provision for comfort. Surgeons have found that the most effectual mode of arresting hospital gangrene is to transfer patients at once to tents, and the rapidity of improvement in the latter situation is remarkable. Now, the question arises, may not out-door exposure, or what is equivalent thereto, be useful in many acute diseases? Its usefulness in chronic affections is acknowledged. This question is worthy of consideration with a view to experimental observation. It would not be surprising if patients affected with fevers and acute inflammations were found to improve in a notable degree under the freest possible exposure to air. As to the choice between such exposure and insufficiency of space and ventilation, there is, of course, no question. There are facts enough bearing on this point. But the question is whether such exposure may not be advantageously added to the observance of the usual sanitary requirements respecting air. Free and daily exposure is important as a means of preserving the vigour of the body in health; may it not be equally important as a means of keeping up the vital powers in disease? Every one accustomed to spend much time in hospital wards, must be aware of the sense of debility felt after remaining there for even two or three hours. How different the feeling after having been in the open air for the same period! How would the strength and energy of mind and body flag, if an active, healthy man were confined for successive days and weeks to an apartment, with the air sufficiently renewed to preserve its purity, but kept steadily at a uniform warm temperature! How refreshing would be cool breezes and alternations of heat and cold after such a confinement! Do not these facts apply to the body and mind in disease as well as in health? As a general rule, the hygienic circumstances required by conservatism in health, are not less important in disease; and it is at least highly probable that, as respects the depressing effects of confinement in heated rooms on

the one hand, and the invigorating effects of free exposure to air on the other hand, sanitary laws are applicable alike to disease and health.

As bearing indirectly on this topic, I may refer to instances of persons passing safely through fevers and acute inflammations, in situations in which they are necessarily exposed to atmospherical vicissitudes. For example, I have reported a case of pneumonia affecting one entire lung, the patient living entirely alone in a shanty, in the winter season, in Louisiana; the shanty in a swamp, the floor of earth covered with water; his subsistence consisting of bread and water with a bottle of whiskey, and the evacuations passed in bed. The patient was discovered and removed from this situation to the Charity Hospital of New Orleans already convalescing, and he rapidly recovered. I have known a patient affected with pneumonia escape from the ward in a state of delirium during the night in the winter season, wearing only a cotton shirt, and walk a distance of two miles to a house where he had formerly lived. He was brought back to the hospital the next day, free from delirium, and he convalesced rapidly, having received no detriment from this great amount of exposure and exertion. Examples analogous to these occasionally fall under the observation of all practitioners. They show, at least, that prevailing apprehensions of danger from exposure to atmospheric influences, during the progress of acute diseases, are much exaggerated. This remark will apply to early gestation in convalescence from acute diseases. It was formerly supposed that most acute diseases left behind them a liability to relapse, or a condition favourable for the development of other affections; and, therefore, that great care must be taken to avoid all exertion, and especially the morbific agency imputed to cold. A better knowledge of the natural history of diseases has taught us that, as a rule, there is little or no tendency to relapse, and that the sequels of certain diseases proceed from intrinsic tendencies. Of the hygienic circumstances favouring rapid and complete restoration to health, getting up as soon as the strength will permit, and gentle exercise in the open air, are among the most efficient. I could cite illustrations of this fact in abundance. As I am writing, a striking instance comes to my mind of a fellow-practitioner who had kept the bed for a long time with chronic pleurisy, accompanied with great debility and emaciation, and, finally, bed-sores were added to his sufferings. At this juncture he was taken out of bed, placed in a carriage, and driven a short distance. The effect on body and mind was such that the experiment was repeated. He continued to ride out daily, and rapidly recovered. This was many years ago; he is now in good health and in active practice. This is a striking instance among many exemplifying the hygienic importance of air and exercise in determining convalescence and promoting recovery.

Are the requirements of conservatism fully met by a due appreciation of all that pertains to mental hygiene in disease? This question will lead to

a few remarks which will conclude my brief consideration of conservatism as applied to hygiene in disease. Physicians are not unmindful of the reciprocal influences of mind and body. It would be trite to assert their existence and importance. They are patent to every medical observer. But it is perhaps true that mental conditions are more largely concerned in either favouring or antagonizing disease than is generally supposed; and, hence, that the therapeutic value of hygienic influences acting primarily on the mind, are not sufficiently appreciated.

It is obvious that the capacity of resisting and recovering from disease varies in different persons. The same disease, having apparently the same intensity, will destroy some and not others. And there is a wide difference as regards the duration of life with a similar amount of incurable lesions. Take, for example, pulmonary tuberculosis, how great the diversity in the extent of destruction of the lungs in cases in which this disease alone has produced death! Now this intrinsic power of overcoming disease, and of living on with irremediable affections which will sooner or later prove fatal, is not altogether vital but in part mental. If the faculties of the mind be not impaired or obscured by disease, the patient is rarely indifferent to its progress or the result; it is accompanied by more or less emotional activity. Much, often very much, depends on the character of the predominant emotions. Hope, confidence in the physician and the means of cure, reliance on the wisdom of Divine Providence, are sentiments which sustain the vital powers and are conservative. On the other hand, discouragement, apprehensions, dissatisfaction, impatience, depress the vital powers and are non-conservative. The character of the predominant emotions will, of course, depend in a great measure on mental constitution, education, habits of thought and feeling, etc., with reference to which there is nothing like uniformity in different persons; but judicious management on the part of the physician may determine their character to a greater or less extent. The ability to secure complete confidence, to exert an influence over the minds of patients, enhances, in no small degree, the skill of the physician. As belonging legitimately to the practice of medicine, this is not enough considered. But the skilful exercise of a moral power requires accuracy of diagnosis and knowledge of the laws of disease. If the physician be not able to judge correctly of the situation of a patient, he cannot give the assurances which the nature of the case may warrant; prudence, as regards his own reputation, dictates great reserve, and he depresses his patient by non-committalism. In a dispensary practice limited to affections of the chest, I have been forcibly impressed with the good which may be done in many cases by simply declaring *ex cathedra* the absence of consumption or an affection of the heart. Poor patients, after having perhaps suffered long from secret apprehension of serious disease, come tremblingly, at length, as if to hear their doom pronounced. Thanks to the invaluable methods of physical diagnosis, the healthy state of the thoracic organs may

be positively ascertained. How delightful to witness the transition from despondency to joy, when soundness of the suspected organs is announced and believed! The moral effect is often of more efficacy than any medicinal remedy. It would be easy to cite numerous instances of mental suffering with physical disorder persisting many years, for the lack of an authoritative assurance of the non-existence of a fatal malady.

It does not enter into my plan to discuss the various means by which mental influences may be brought to bear on the management of diseases. I wish only to bring forward the fact that here is an important province of conservative medicine. A topic suggests itself in this connection which I will not pass by, because it relates to a matter concerning which the opinions and conduct of medical men differ: I refer to the co-operation of the clergy in cases of disease. Some physicians take the position that during the progress of diseases involving danger to life, the ministrations of religion are liable to interfere with recovery by producing excitement and discouragement. I desire to bear testimony against this position. Divesting the topic of all considerations save those which relate to the influence upon the progress of the disease, experience has led me to have no fear of harm from the timely and judicious offices of clergymen and religious friends. On the contrary, the effect is often manifestly salutary.

If the mental functions remain intact, every patient must think of the probability or possibility of an existing disease ending fatally. There can be no stronger evidence of an imbruted mind than the absence of all thought of danger. And the doubt, uncertainty, and anxiety engendered by the patient's reflections occasion a more depressing effect than even a definite expectation of a fatal result. Every physician knows how common it is to be entreated by the patient to make known to him his actual condition, to tell him the worst, a painful state of suspense with respect to death, as well as any event involving a deep personal interest, being more difficult to bear than its anticipation. For this reason, although a certain amount of reserve may be allowable, the physician should, as a rule, meet the demands of the patient for explicit information with candour, and he should never violate the truth. The most favourable condition of mind, in a hygienic point of view, is that induced by confidence and hopefulness in union with a cheerful resignation to the will of God. In so far as the services of the minister of religion conduce to the latter, he becomes the coadjutor of the physician. Irrespective of life and health, this topic has relations to momentous interests which would be here out of place, even if the writer were presumptuous enough to consider them. I wish simply to record the opinion, as a physician having had considerable opportunity for observation, that so far from there being any ground for antagonism, the minister of religion may effectively co-operate with the medical practitioner in behalf of the physical welfare of the sick.

Attention to mental hygiene in hospitals often falls short of the require-

ments of conservatism. The violations of conservatism, in this regard, consist, in the first place, of circumstances which tend to depress the vital powers by their influence on the mind, and, in the second place, in the absence of circumstances influencing the mind in an opposite direction. Obvious sources of a depressing influence are apt to be overlooked. One of these is the necessity of witnessing the distressing manifestations of disease in other cases in the same ward. Cases which, from their character, shock or painfully excite the feelings, should, as far as possible, be isolated. To be confined in the same apartment, or, perhaps, to lie side by side with patients in a state of active delirium, or affected with convulsions, or in stertorous coma, or suffering extreme pain, is to be exposed to a depressing influence which one can best appreciate by imagining himself in such a situation. It is melancholy to think that a brutish insensibility is often the only resource against this influence. It is cruel to compel hospital patients to witness the phenomena of the dying act. How often have I seen the most marked evidence of the unfavourable effect of a prolonged agony in a hospital ward! If it be true that the patients may become habituated to these scenes, so as to regard them with indifference, is this a result to be desired! The propriety of assigning wards to tuberculous cases, or to incurable diseases, is more than doubtful as a measure of mental hygiene. What can be more discouraging to a tuberculous patient than to be surrounded with cases presenting all the different phases and gradations of consumption? For this reason consumptive hospitals are objectionable.

The circumstances just referred to may not be under the control of physicians connected with hospitals; but there are circumstances for which medical officers and visitors are exclusively responsible. It is very rarely the case that hospital patients are treated cruelly, roughly, or neglectfully; but the fact of their having the same faculties of thought and the same sensibilities as private patients, is not always sufficiently borne in mind. If this fact were not sometimes forgotten, the nature of the disease, the prognosis, and the appearances which may be expected to be found after death, would never be discussed without reserve at the bedside of a patient; the chances of recovery or death in the cases under observation, the incidents of the dead house, and other topics of a like character, would not enter into conversations held in the wards. It is but just to say that such breaches of conservatism are by no means common, and that when they do occur they proceed generally from the thoughtlessness incident to youth and preoccupation.

There is room for improvement as regards mental hygiene in hospitals, not only by obviating circumstances which exert a depressing influence, but by trying to call into exercise thoughts and feelings which have a salutary effect in disease. It is a great charity to institute for the sick poor places of refuge, furnishing shelter, nourishment, nursing, and medical aid; and for many of the miserable candidates for such a charity, a hospital ward

offers comforts far beyond those to which they have been accustomed. But supplying these needs does not fulfil all the requirements of relief; sympathy, encouragement, and religious ministrations may be added with advantage in a sanitary point of view, irrespective of other and higher objects. For this part of the hygienic management the physicians must depend in a great measure on others. And here is a field for philanthropic labour which lacks husbandmen. How few of the many who are earnest to benefit their fellows think of the sick and friendless poor in hospitals, where, by judicious words and offices of kindness, they might reap a harvest of good works, of which least in importance, although important, is the favourable influence on the course of disease! But I am entering on a train of thought which, for the medical reader, offers nothing new and is not called for, and I therefore here rest my remarks on hygiene in disease.

With this article I take leave of the subject of *Conservative Medicine*. In my first article I endeavoured to show that the term conservatism expresses the great feature of medicine of the present time, and a governing principle in medical practice. In my second article I considered the principle of conservatism as applied to therapeutics. In this third article I have offered a few fragmentary thoughts on the application of this principle to hygiene. With the rise and progress of conservatism we see a great, almost a radical change in practical medicine. This change is a legitimate result of the progress of knowledge. It is not to be expected that medicine is to be stationary; unchangeableness is incompatible with progress. There must be changes if medicine be progressive. Bearing in mind these truths, it is the part of every true physician to try to keep pace with the advancement of the profession.

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## Art. VI.—*On Sunstroke.* By Horatio C. Wood, Jr., M. D., Resident Physician to the Pennsylvania Hospital.

During the heated term of our summers, several classes of cases of what is termed sunstroke are without doubt developed. In this paper but one of these is considered, no other having come under the notice of the writer.

Case 1. J. B., Irishman, æt. about 30, was brought into the ward at 1 P. M., August 2, 1863. He was said to have fallen whilst walking in the street a few minutes before. He was perfectly unconscious, with very laboured breathing. His pupils were not markedly dilated or contracted, and yielded sluggishly to light. His skin was cyanosed and very hot and dry. He had vomited and passed his feces unconsciously. His pulse was

140, quick and moderately strong. He could scarcely swallow. Turpentine injections and brandy were exhibited, but he died at 5 P. M.

*Autopsy two hours after death.*—Rigor mortis marked. Venous trunks of the meninges of the brain loaded with dark blood. Brain substance not abnormal. Lungs congested. Heart rigidly contracted. A thermometer in thorax indicated 108° F.[1] Blood not coagulating, very dark coloured, with a slightly acid reaction. Sp. gravity 1059. 1205 grs. of blood evaporated yielded 550 grains of dry solid matter. 158 grs. of blood yielded 43 grs. of dry impure albumen. Blood corpuscles under the microscope normal, excepting that they were very dark coloured.

Case 2. P. M., Irishman, æt. 64, a moderately stout, muscular man, was brought into wards about 7 P. M., August 10th. His skin was very hot; belly tympanitic; pulse 177, not intermittent, but very weak. He had involuntary discharges; also strange contortions of the face, owing to spasms of the muscles pretty regularly repeated at the rate of 130 times a minute. He was treated with turpentine injections, brandy, aromatic spirits of ammonia, &c. He died quietly about 11½ P. M.

*Autopsy one hour after death.*[2]—Brain with venous trunk of the meninges loaded with blood. Substance normal, not congested. No bloody or serous effusions. Capillaries of the lungs scarcely congested at all, but the blood pouring out of the veins when cut. Heart rigidly contracted. Kidneys normal. Thermometer in abdominal cavity 108° F. Blood very dark and fluid. Sp. gravity 1050. Reaction very slightly acid.

Case 3. G. G., German, a soldier who had served out his time, æt. about 35, intemperate, a very large robust man weighing apparently 200 lbs. He was brought into the wards of the hospital about 1 P. M., August 10, 1863. Those that brought him in said that he had fallen suddenly whilst loading a dray about an hour and a half previous to his admission. When he was carried into the ward his skin was of a dark reddish tint, the capillaries refilling very slowly after being emptied by pressure with the fingers, requiring several seconds to do so. His pulse was 170 and upwards, very irregular and intermittent, but not excessively weak or thready. He was utterly unconscious, but laid perfectly still, without even *subsultus tendinum*. His pupils were contracted. The conjunctiva not sensitive and very much congested. His skin exemplified, *calor mordax*. A thermometer placed in his axilla indicated 109° F. His breathing was slow and very laboured and irregular. He had involuntary discharges of feces. All these symptoms grew worse and worse, his skin darkened; breathing became slower and slower; pulse failed, and before death, which occurred about 2½ P. M., dirty foam trickled down from his nose and mouth. He died quietly without convulsions.

*Treatment.*—Frictions with ice, brandy and ammonia as much as could be forced down him. Turpentine injections.

*Autopsy one hour after death.*—Cadaver very hot, no rigor mortis. Meninges of the brain with the large venous trunks loaded with blood. Brain substance normal, no exudation of blood or serum. Walls

[1] Three thermometers were compared and found to agree in these cases, so that there can be no doubt as to the reliability of the observations.

[2] Most of the autopsies previously reported were made 8—10 hours after death. In a cadaver at the high temperature of these bodies there must be putrefactive changes in that space of time.

of the abdomen and thorax with the abdominal contents loaded with fat. Lungs with their capillaries and venules not congested, but from their larger veins the blood poured freely. Heart slightly concentrically hypertrophied, very firmly contracted. Kidneys normal. Liver fatty. Bladder empty, very firmly contracted on itself. Blood very dark coloured, fluid, showing some slight indications of coagulating, but not forming more than a very few shreds.

CASE 4. C. H., apparently an Englishman, over 60, was brought into the wards of the hospital at $1\frac{1}{2}$ P. M. (Aug. 11). He was said to have fallen whilst walking along the street, between one and two hours previously. When brought in he was very restless, almost convulsive; breathing laboured and noisy; pulse 170, and slightly intermittent; skin intensely hot, a thermometer in his axilla indicating 109° F. He could only swallow a teaspoonful at a time and that with difficulty. His pupils were contracted and conjunctiva dry, non-sensitive, and injected. There was some stasis in the capillaries of the skin, but it was not strongly pronounced.

Brandy, aromatic spirits of ammonia, and turpentine injections were exhibited; he was also rubbed with ice, but died in half an hour.

*Autopsy one hour after death.*—Cadaver very fat. Meninges of the brain with their venous trunks distended with very dark blood. Substance not strikingly congested. Ventricles distended with a large amount of slightly reddish serum. No effusion of blood. Heart slightly hypertrophied, firmly contracted. Lungs with their capillaries free from congestion, but the blood pouring from the veins when cut. Liver in a state of fatty degeneration. Kidneys normal. Spleen very much enlarged and softened. Bladder empty, rigidly contracted on itself. Blood very dark, coagulating, but not so firmly as normal.

CASE 5. P. B., Irishman, only a few days in this country. He was said to have fallen during the latter part of the afternoon, Aug. 11, whilst wheeling coal on Smith's Island, in the Delaware.

He states that he had drunk freely of ice-water, but had not sweated any; that he had no premonitory symptoms—no signs of exhaustion, no optical phantasma, no alteration of colour of surrounding objects, no headache, etc. When brought in (9 P. M.), he was in a state of semi-consciousness, but could scarcely speak intelligibly; his pulse was moderately strong, 90 per minute; surface dry, but not inordinately hot; he had no pain, but complained of great weakness; he apparently had not had involuntary discharges.

*Treatment.*—℞. Ammoniæ muriat. gr. x; Sp. frumenti f℥ss; Aquæ f℥j, every half hour, and an injection of an ounce of turpentine.

At $10\frac{1}{2}$ P. M. his pulse had fallen to 80, and his general condition much improved. Ordered his medicine to be given every hour only.

August 12th he was entirely conscious, but very drowsy, and slept a great deal. August 14th he had entirely recovered, and regained his strength.

CASE 6. J. B., an intemperate Irishman, æt. about 33, was brought into the ward $3\frac{1}{2}$ P. M., Aug. 14, 1863. His wife stated that on the 10th of the month he was exhausted with the heat, sick at his stomach, with a terrible headache, etc., so that he was forced to give up work until the morning of the 14th. When he entered the ward, his skin was moist, but

hot, and covered with a rubeoloid eruption. A thermometer between the thighs indicated 104° F. His pupils were slightly contracted; his conjunctiva was injected, but very sensitive; he had not had (as far as could be ascertained) involuntary discharges. His pulse was 140, rather feeble; he was entirely unconscious, but muttering to himself unintelligibly, and very restless. He vomited freely.

*Treatment.*—Cold water poured by the bucketful over head and breast, turpentine injections.

At 4 o'clock his restlessness was replaced by convulsions, with opisthotonos. These convulsions lasted some five or six minutes each, and were somewhat epileptiform; but as there was no saliva he did not foam at the mouth, although his jaws worked violently; his breathing was for the most part very hurried, shallow, and irregular, but occasionally laboured and slow. He passed a few drops of urine, and the injection operated on his bowels. Brandy was attempted to be exhibited, but it always brought on immediately fearful convulsions, probably owing to the difficulty of deglutition. The cold effusions lowered the temperature of the skin, but did not resuscitate him in the least.

At 4½ o'clock the douche was repeated, but this time threw him into violent spasms, with vomiting, and great congestion of face. From this time his symptoms deepened, his body became very dark blue or purplish, and he died quietly at quarter past five. No post-mortem could be obtained. This case differed somewhat from the others—was the previous exhaustion the cause?

CASE 7. An Irishman, æt. apparently 40, a stout, muscular, but not fat man, was brought into the wards Aug. 14th, about 8 P. M. He was said to have fallen about 3 o'clock. When he was carried in, he was perfectly unconscious, somewhat restless, with *subsultus tendinum*, as well as more decided muscular twitchings. His tongue was very dry, his skin was dry and harsh, hot, but not so excessively so as in some cases. A thermometer in his axilla indicated 104° F.; his pupils were slightly dilated; conjunctiva injected; pulse 150, weak, not intermittent, but somewhat fluttering; breathing 48 per minute, and very laborious; he could swallow only with difficulty. Before he came in, he had had mustard sinapisms on legs, stomach, etc.

Ordered brandy f℥iij, immediately.

At 9 P. M. his condition was unchanged, excepting that his pulse was more fluttering and marked. Ordered brandy f℥j every half hour.

His symptoms went on from very bad to worse, and he died quietly about 11½ P. M.

*Autopsy one hour after death.*—No rigor mortis. Meninges of the brain, with their large venous trunks full of dark blood. Substance of the brain very slightly, if at all, congested. Ventricles with considerable serum in them. No effusion of blood. Lungs with their capillaries not congested, but the blood pouring from their veins when cut across. Heart rigidly contracted, walls somewhat thickened, and very firm. Liver very large and fatty. Kidneys somewhat congested. Thermometer in abdominal cavity 106° F. Blood very dark and fluid, with a decidedly acid reaction.

CASE 8. C. B., German, a large and very muscular man, was brought into hospital about 12½ P. M., August 15th. His skin was very hot and dry; a thermometer in axilla indicating 109° F.; he had passed his feces invo-

luntarily, and a little urine after his admission; his pupils were about normal in size; conjunctiva injected; mouth moist; deglutition almost impossible; he had a severe convulsion shortly after his entrance, and died in less than an hour. There was a large ecchymosis in one axilla. He fell whilst working in a sugar refinery where the heat was intense, and was brought immediately to the hospital.

*Autopsy two hours after death.*—Meninges of the brain, with their veins filled with blood. Some serous exudation in ventricles, but scarcely more than normal. Lungs with their capillaries not congested, but the blood pouring from their veins when cut across. Heart rigidly contracted. Liver very fatty, with its veins loaded with blood. Thermometer in abdomen indicating $110\frac{3}{4}°$ F. Blood decidedly acid, very fluid, without a sign of coagulation; under the microscope, the red globules were possibly a little more opaque than normal, and aggregated in rouleaux and masses. No abnormal proportion of white corpuscles.

*Remarks.*—Sunstroke is often preceded by well-marked prodromes. Dr. Swift speaks of subjective optical sensations, of all surrounding objects being coloured, and Dr. Taylor (*Lancet*, 1858) of a violent and peculiar pain in the hypogastric region as being frequently present in their cases before the attack.

Case 5 is the only one in which I have been able to make any observations on this point. This patient was questioned repeatedly and very carefully as to any unnatural feelings, any sense of exhaustion preceding his attack, and his answers were so consistent as to establish the fact that there was in him nothing whatever to give intimation of what was about to happen, except it were great thirst and diminished excretions. When an individual falls, he does so suddenly, and instantly loses all knowledge, either of the surrounding world or of the microcosm within. If he recovers, that period is a total blank in his remembrance. In the fully formed disease, the unconsciousness is perfect, but reflex action is not suspended, at least in most cases. I have seen convulsions excited by an attempt to administer brandy, and sometimes touching the conjunctiva will produce violent contractions of the muscles of the face. Convulsions occur frequently, and may be very severe. Every manifestation of disordered cerebro-spinal action, from subsultus tendinum to eclampsia, takes place. One case had been subject to epilepsy, yet he had no convulsions whilst in the wards of the hospital. The skin is frequently cyanosed, and sometimes has ecchymosis beneath it. A better example of calor mordax is seldom seen, and the thermometer indicates a remarkably high temperature. The range in an instrument placed in the axilla has been in our cases from 104° to 109° F. In the body which manifested the last degree a thermometer, placed in the abdomen shortly after death, showed $110\frac{3}{4}°$ F. The cases in which the greatest altitude is reached, are those where there is the greatest destruction of the blood crasis. The pulse is very rapid and quick, and often, in the earlier portion of the attack, not devoid of force.

The pupils in the early stage are mostly moderately contracted, and are either insensible to light or respond very sluggishly to it. As death approaches they often become widely dilated. The conjunctiva is always more or less injected and dry, and sometimes insensible to the touch. The tongue may be dry and chapped, or it may be moist. In some individuals the salivary glands secrete a dark abnormal saliva—in others, they cease their work. The breathing is always laborious, very generally rapid as well as deep, and, in many instances, it is evident that there is no paralysis of the phrenic nerve, that the lungs are ready to do their share in depurating the blood, and that the non-oxygenated condition of the life fluid is owing to what Virchow denominates paralysis of the red corpuscles. Vomiting almost always takes place; watery bilious matter, with the contents of the stomach, being rejected. The renal secretion appears to be entirely suspended. It would be very interesting to know whether it was so before the attack or no. But as liquid involuntary discharges from the bowels took place in most of the cases before admission, it was impossible to judge. A few drops of urine were passed by one or two whilst in the ward. The probability is, that the function of the kidney is very materially diminished, but not altogether suppressed before the affection manifests itself. I have not seen hemorrhages from any mucous surface, but see no reason why they may not occur. These symptoms generally grow worse and worse, the patient weaker and weaker, and the case runs on to a fatal termination. The approach of death, although rapid, is insidious. Convulsions, when present, subside, and the end is brought on by loss of power in the central nervous system. Very rarely recovery takes place. Then the symptoms subside, the pulse falls, and life begins to dawn on the patient. The return of consciousness is slow, and unpleasant sequelæ are said sometimes to occur, but in the case in this hospital the patient in forty-eight hours was perfectly recovered.

The results of the autopsies were both negative and positive. There was a total absence of all inflammatory products, or any signs of active congestion. The blood was found very fluid, dark coloured, with an acid reaction, and a loss of its power of coagulating. The *heart* was, in all the cases, *rigidly contracted*. The veins were surcharged with blood. Must not the symptoms of this malady be owing to one of the three following causes: 1. Inflammation or active congestion. 2. Nervous exhaustion. 3. Morbid condition of the blood. That it is not owing to the first, the autopsies abundantly certify. Exhaustion is manifested by general loss of power, accompanied by relaxation of the whole system, a feeble, although it may be quick pulse, and a cool, moist skin and disturbed sensorium. There may be, indeed, apparent strength, but this is merely simulated, and is characterized by convulsions, jactitation, and great restlessness. If the symptoms of uncomplicated mania-a-potu, which may be taken as the

type of the class, are examined, is not this description seen to be correct? Is not a hot, dry skin present in any supposed case of delirium tremens an unerring indication of the existence of more than that disease? is it not significant of the presence of some inflammation or blood-poison? Further, is not exhaustion gradual in its approaches? How, then, can the suddenness of the attack and the hot, dry skin be reconciled with the idea of nervous exhaustion? Is it at all consistent with the character of the latter class of diseases, that a man, strong and robust, should one moment be in full vigour, and the next, utterly without warning, be stricken down as by a flash of lightning? In an autopsy after fatal exhaustion, flabby muscles and a worn-out heart would be the lesions naturally looked for. The nervous system has a wonderful influence over the whole economy, but in what simple nervous disease are changes wrought in the blood? The blood is frequently abnormal, but as a preceding, not consequent phenomenon of the nervous disorder. It seems utterly foreign to all the present knowledge of the pathology of the nervous system, that nervous prostration should in a few hours totally destroy the coagulability and alkalinity of the blood.

If sunstroke be not owing to inflammation nor yet to exhaustion, it must be due to some alteration in the blood. Now, what class of people are most obnoxious to blood diseases? The unacclimated and intemperate. Who are almost the only persons attacked by *coup de soleil?* The unacclimated and intemperate. How do blood diseases commence? Most generally they are preceded by prodromes, but very frequently they develop in an instant their full force. Witness scarlatina maligna, pernicious fever, &c. What obstetrician has not seen his patient, previously without a bad symptom, perhaps whilst he is congratulating her on her safe delivery, instantaneously seized with a convulsion? How does sunstroke begin? Most generally prodromes presage its coming, but frequently its victim is stricken down utterly without warning. After the first manifestations of a blood disease, there is generally a paroxysm of fever. So is there in *coup de soleil.* For could any set of symptoms agree more thoroughly with Prof. Wood's definition of fever, which is as follows [*Practice of Medicine*, vol. i. p. 90]: "Fever is an acute affection, in which all the functions are more or less deranged; the most striking phenomena being sensorial or nervous irregularity, increased frequency of pulse, increased heat, and disinclination for food." Ecchymoses are characteristic of an altered blood. They occur in sunstroke. There is also an odour peculiar to this malady which finds its analogue among the blood affections. Scarlatina maligna, puerperal convulsions, &c., occasionally prove as rapidly fatal as sunstroke. Finally, the pathognomonic post-mortem results of a fatal blood disorder are alteration and destruction of the crasis of the life-fluid, without structural change in the solids. This is precisely what is found after death from *coup de soleil.*

The true pathology of the disease appears, then, to be as follows: The excessive heat causes a suspension of the functions of the excretory glands, and produces changes in the life-fluid probably more than the simple retention of effete material. These alterations in the blood are trifling at first, but are progressive, so that in a short time some agent or agencies are evolved capable of producing the fearful cerebral symptoms. The name of "sunstroke" is very indefinite, and if the pathology advocated in this paper is correct, thermohæmia or thermic fever would be more in accordance with the modern system of nomenclature.

The preventive treatment of this malady is, of course, to avoid the cause. But there is a popular prejudice, that drinking cold water is injurious. This in former times was held by the farmers around the city, and it was thought necessary to guard the water with ginger, &c. But all this has been abandoned, and ice water is now used *ad libitum* through the country. The cause of this prejudice is probably that the commencing blood changes and great heat of the body create excessive thirst. If the glandular system can be kept active, there is much less danger to be apprehended; and is not water a powerful stimulant to the secretions? Is it reasonable, that water should be withheld from a system whose blood is being deprived of its serum, it may be, by pints, through the perspiratory glands?

The treatment of the fully developed disease has been in our hands utterly futile. The case that did recover would have done so if nature had been left to herself; in all the others, the condition of the blood, when brought in, precluded all hope. I know of no agent that will check directly the tendency to degradation of the life-fluid. The regular treatment in this hospital is to give a turpentine injection, and administer stimulants. Both of which are in most cases of no avail. The indications are first to check the changes in the blood, and secondly, support the system. But unless the first can be fulfilled, the second is useless. Dr. Taylor (*loc. cit.*) states, that he did not lose a case during April, 1852, when many were stricken down with well-marked symptoms, and when he practised cold affusions, water being poured on them continuously, until they showed signs of returning consciousness. This result is so wonderful as to make one doubt whether there is not some difference in the disease as seen in the East Indies and in this country. But the plan certainly ought to be tried, as it may possibly check chemical change by reducing the temperature, and at the worst can only be equally hopeless with all the others.

Art. VII.—*Case of Resection of the Head and Upper Third of the Humerus for Enchondromatous Tumour.* By Hanford N. Bennett, M. D., of Bridgeport, Conn.

Some time in the month of May, 1860, Mr. Henry A. Andrews, of Brookfield, Conn., a farmer by occupation, discovered a tumour upon the outer face of his right arm, directly underneath the belly of the deltoid muscle. Its discovery was altogether accidental; it had been preceded by no local pain, had already attained considerable size, and could be traced to no cause except it might be the severe muscular exertion incident to the patient's calling. I was consulted soon after and found, upon examination, a tumour of bony hardness, about the size of a hen's egg, immovable, with no irregularities of the surface, and not tender to pressure. Thinking that it might be a simple exostosis, I advised no operative procedure, but merely care in the use of the limb. I did not see the case again until August of the following year. The tumour had now attained large dimensions, having extended upwards nearly to the head of the humerus, and the whole of the deltoid being stretched over its surface. A similar growth was also projecting from beneath the outer edge of the deltoid muscle, covered only by the skin and cellular tissue, nearly globular in form, and exhibiting a slightly nodular surface to the feel, which was not at all discoverable beneath the thick belly of the muscle. I could not now doubt that the tumour was an osseous or osteo-cartilaginous outgrowth. It was already impairing the use of the limb, especially in those movements controlled by the deltoid, and I advised the patient to submit to an operation as soon as he could arrange for that purpose. Various circumstances, however, prevented a compliance with this advice, until the 8th of January, 1862, when he presented himself for operation. The arm being now measured over the largest portion of the tumour, was seventeen inches in circumference, and the outgrowth extended from the neck of the humerus to the insertion of the deltoid, presenting no irregularities except that which projected from beneath the outer edge of this muscle, the main body of the tumour being of very symmetrical rotundity. The patient suffered no pain in the affected part, and no inconvenience except the loss of the horizontal motion of the arm, and a sense of weight which was now beginning to be considerable, and which would have undoubtedly soon produced relaxation of the ligaments of the joint, and finally luxation of the head of the bone.

The history of the case and the perfectly healthy appearance of Mr. A. led me to believe that the tumour was benign in its character, but its growth had been somewhat rapid, and the diagnosis could but be uncertain. In view of all the circumstances, I proposed a resection of the bone and outgrowth rather than an amputation at the shoulder joint, and with this intention

called Dr. Jonathan Knight, of New Haven, and several of my medical friends of this city to consult upon the case, and if thought advisable, to assist at the operation. The result of the consultation at this time was unfavourable to an attempt at resection, its feasibility being questioned in consequence of the large size of the tumour, and the ulterior usefulness of the limb being doubted from the extent of bone which must necessarily be removed. It was agreed, however, that a small incision should be made down to the tumour, for the purpose both of ascertaining the relations of the outgrowth to the bone, and of determining its true pathological character; if it should be found that the bone was not involved so as to necessitate the removal of the head, then I was to attempt an exsection merely of that portion of the shaft of the humerus included in the disease. The examination proved conclusively that no operation short of a resection involving the head of the bone was practicable, and this was negatived. A minute piece of the foreign growth was removed and examined with the microscope and its non-malignant nature thus rendered quite certain. The patient was now dismissed to await the further progress of the disease, as I had determined not to amputate the limb until such time as it should become an absolute necessity. The small wound made at this time, however, could not be healed in consequence of the extreme tension produced by the outward pressure of the tumour, and suppuration became very profuse, so much so that it soon told seriously upon the general health of my patient. He rapidly emaciated, and in short presented all the constitutional symptoms of suppurative irritation, so that at the end of five weeks it became evident that something must be done immediately, and notwithstanding the apparently unfavourable condition of things, I determined to attempt the resection.

On the 14th day of February, 1862, I proceeded to the operation, assisted by Drs. Wm. B. and David Nash, Drs. Hubbard, Burritt, and Gregory, all of this city. I adopted the method of Larrey, the only one, in fact, practicable in this case, and, the patient being put fully under the influence of ether, I made an incision along the outer face of the arm, directly over the most prominent part of the tumour, commencing just above the point of the acromion and terminating a short distance below the insertion of the deltoid, thus completely bisecting this muscle (which was much atrophied) in the direction of its fibres. Two arterial branches were divided, which were immediately tied in order to lessen the amount of hemorrhage as much as possible. I was able to detach the integuments from a considerable portion of the outer and more prominent surface of the tumour by the aid only of my fingers, and then having carefully separated the periosteum from the bone immediately below the excrescence, I passed a spatula underneath the humerus and sawed it off just at the insertion of the deltoid. Having now command of the bone, it was not difficult, by a careful dissection, to sever the connections with the muscles; I

succeeded, also, in saving a narrow strip of healthy periosteum, varying from half to three-fourths of an inch in width, along the inner face of the bone almost to its neck. After finally dividing the insertions of the pectoral and latissimus dorsi muscles, using the bone as a lever, its head being rotated forwards and outwards, the capsular ligament was divided and the resection completed. I should add that care was taken to preserve the tendon of the biceps. The wound was now closed with sutures and adhesive straps, and having flexed the forearm so that it would lie horizontally across the abdomen, I fastened the entire limb in this position to the trunk by long adhesive straps reaching well around the body. The patient was much prostrated by the operation, but rallied quickly from the effects of the ether, and after the administration of a full dose of sulphate of morphia, slept quietly about two hours. From this moment the case progressed steadily to a complete healing of the wound, and to a perfect restoration of health. A somewhat profuse suppuration commenced a few days after the operation, but the appetite and digestion being excellent, the waste was supplied, and Mr. A. gradually gained strength, so that at the end of five weeks he was enabled to go home by railroad, a distance of twenty-five miles. The external wound was now healed, with the exception of two points from which the pus issued, and I instructed the patient to commence passive motion of the forearm, the movements of the hand having been at no time impaired. Suppuration ceased entirely at the termination of the sixth week, and the wound was permanently closed. In the month of May following (three months after the operation) the Connecticut State Medical Society met in this city, and I presented my patient to this body. The flexion and extension, pronation and supination of the forearm, were already nearly perfect, and the limb, in walking, hung in a natural manner; so much so that no one would observe any alteration in its carriage. From that period the strength, and consequently the usefulness of the arm, have steadily improved up to the present time, though the horizontal movement is of course lost. At this date, sixteen months after the operation, I have just received a letter from Mr. Andrews, in which, speaking of the usefulness of the arm, he says he "*can plant corn as fast as any man.*" The limb has shortened nearly an inch and a half, and I am satisfied, from an examination which I made on the 1st day of April of this year, that there has been a slight reproduction of bone up to within two inches of the glenoid cavity.

*Remarks.*—An examination of the tumour after its removal showed a conglomerate of cartilage and bone, which had sprung from the surface of the humerus, and had been developed in nodules of cartilage, which ossified from their centre, thus imitating the normal process of the ossification of cartilages. The form of the outgrowth had evidently been moulded to a considerable degree by the action and resistance of the deltoid, and this muscle seemed as it were to grasp the tumour beneath its fibres, with the exception of that portion which projected beneath its outer edge; between

this and the main body of the excrescence was a deep sulcus, evidently formed also by the action of the muscle. The outgrowth did not entirely surround the bone, but left intact a narrow strip on the inner face, from which, as I have before stated, I detached and saved a small portion of healthy periosteum. The length of bone removed, including the head, was five and a half inches; the tumour involved it from the neck of the humerus to within half an inch of the point at which is was sawed off, and was thirteen inches in circumference at its largest part, measuring in the direction of the circumference of the bone.

I was not aware, at the time of this operation, that resection of the head of the humerus for bony tumour had been so rarely performed. As far as I can learn, my case is the first in this country, and the records of European surgery furnish only five examples of analogous character. Dr. Hodges, of Boston, in his admirable monograph on excision of joints, mentions four of these, viz., two by Mr. Hutchinson, one by M. Roux, and one by Bickersteth. The three first were unsuccessful in their results, as the disease was in each instance of malignant nature, the patients either dying soon after the operation, or later from a recurrence of the disease. The case of Mr. Bickersteth was a simple exostosis, and the operation was undertaken for the purpose of relieving the motions of the joint, the result being satisfactory. Prof. Syme has also operated successfully in a case of bony tumour (non-malignant) involving the head of the humerus, his patient recovering with a useful arm. As I have never read the report of this case, I am unable to say certainly what was the extent of the resection, but believe it involved less of the shaft of the humerus than my own.

Prof. G. B. Günther, of Leipzig, in the edition of his large work on operative surgery now in course of publication (*Lehre von den blutigen Operationen am menschlichen Körper*), has a table of seventy-six cases of resection of the head of the humerus, chiefly drawn from the records of continental surgery, but not one of these was for bony tumour, the whole number being made up of resections for gunshot wounds, caries, or compound or comminuted fractures.

It will be seen from the cases thus far recorded, that those for bony tumour of a malignant nature have all been unsuccessful, while those of a benign character have all been successful, both as regards the recovery of the patient and the usefulness of the limb; so that although the cases are too few in number from which to draw accurate conclusions, yet as far as they go, they indicate the propriety of resection in cases of non-malignant disease in preference to amputation at the shoulder-joint. And even in malignant affections of the bone, it is questionable whether the results thus far attained favour amputations at the joint in preference to resection, since the statistics of the amputation, even under the most favourable circumstances, present a frightful percentage of mortality.

BRIDGEPORT, CONN., July 2, 1863.

ART. VIII.—*Excision of the Os Calcis.* By Assistant Surgeon C. R. GREENLEAF, M. D., U. S. Army.

SERGEANT THOMAS C. BARBIN, Co. C., 81st Regiment Pennsylvania volunteers, aged 18 years, native of Philadelphia, was admitted to the Mower U. S. A. General Hospital, Chestnut Hill, on the 15th of January, with a gunshot wound of his right heel.

At the battle of Fredericksburg, Dec. 13, 1862, while in the act of leaping a fence, he received a wound from a conoidal ball, which entered the os calcis on its external surface, and, passing forwards, inwards and slightly downwards, made its exit from the inner surface of the bone near its articulation with the astragalus. Considerable hemorrhage attended the wound, and at a house near by a bandage was applied, and he was sent on to the Mt. Pleasant Hospital, Washington, from whence he was shortly afterwards, in company with others, transferred to Philadelphia. No careful examination of the condition of the wound was made, on his admission, owing to the swelling of the soft parts; cold water dressings, and perfect rest, was the only treatment used. Pus was discharged very freely from the wound, and occasionally small portions of the cancellated structure of the bone came away. Several abscesses formed both on the inner and outer side of the foot, and on opening were found to communicate with the bone.

On the 12th of May (five months after the receipt of the injury), the bone showing no signs of healthy action, it was decided, after a consultation, to excise it, and, accordingly, on the 16th, assisted by Drs. J. H. B. McClellan, C. R. Maclean, and others, I proceeded with the operation, the patient being under the influence of chloroform. An incision was commenced on the external surface of the foot, a little in front of the calcaneo-cuboid articulation, and carried in a direction parallel to the long axis of the foot, around the heel to a point about five lines posterior, to the posterior tibial artery; the flap thus formed was dissected down, the knife being kept close to the bone. Some hemorrhage which occurred was easily controlled by the use of Monsell's solution. Another incision was then made at right angles to, and joining the first, through the tendo-Achilles, about two inches in length; these flaps were dissected off, and the disarticulation commenced from behind; some difficulty was experienced in separating the calcis from the astragalus, owing to a bridge of callus which was thrown across this articulation, and which had to be cut through by the bone-nippers. No arteries required ligation. The flaps were then cleaned off and brought together by silver wire sutures, an opening being left at the juncture of the vertical with the horizontal incisions for the drainage of the pus. The patient was placed in bed, a cloth saturated with cold water was laid over the wound, and half gr. morph. sulph. was given. The bone was found much shattered, and its internal structure filled with pus; the

cartilage at the astragaloid articulation was eroded, and callus had been thrown across from the sustentaculum tali, uniting the calcis and astragalus.

Some slight febrile action was controlled by diaphoretics, and on the 18th the leg was placed in a Smith's anterior splint, and suspended to a frame over the bed, thus allowing free access to the wound, and good position for the drainage of pus. On the 21st there was some puffiness of the flaps, owing to the closure of the opening for the escape of fluids, which was reopened carefully by a probe, and a tent introduced, a large quantity of grumous matter escaping. The incisions have all healed by first intention, and the sutures were removed. From this date, he continued to improve, and on the 9th of June was moving about the ward on crutches.

July 8th, completely recovered. The wound is thoroughly healed, and a firm elastic cushion has taken the place of the calcis; by placing a soft pad in his shoe he is able to move about on the foot, with the aid of a cane; the cicatrice is well upon the posterior part of the heel, and any amount of pressure can be borne without pain. Permission was now given the patient to remain at home with his parents for a few weeks. He returned to the hospital on the 1st of August, able to walk perfectly well without a cane; has no pain, and suffers no inconvenience from the operation.

MOWER U. S. HOSPITAL, Aug. 16, 1863.

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## ART. IX.—*Case of Fracture of the Coronoid Process of Ulna.*

By EDWARD L. DUER, M. D., of Philadelphia.

IT having been my fortune, just now, to meet with a case of, to my mind, undoubted fracture of the coronoid process of the ulna, the exceeding rarity of which is so ably borne testimony to by Prof. Hamilton and others, I am induced to believe that a history of the case will be acceptable to the profession, in order to the more full intelligence of the subject.

CASE. W. B., a stout, hearty little fellow, six years of age, came under the charge of Dr. Howell, an intelligent and experienced physician of Allentown, N. J., the 30th day of April last, having just tumbled, headlong, from a rick of hay to the barn floor, a distance of about five feet, and presenting a seemingly uncomplicated dislocation backwards on the humerus, of both bones of the right forearm. The Dr. states that the dislocation was readily reduced, accompanied with a decided snap, by moderate extension and counter-extension, whilst the arm was slightly flexed and supinated, and was thus maintained by supporting the hand in a sling, with the forearm at an angle of about eighty degrees with the arm. This, indeed, alone constituted the dressing. Three days later, when the Dr. again saw the case, the sling had become so elongated as to permit of the arm's making a much greater angle than when first arranged, but the elbow was much swollen, and nothing wrong was suspected. The hand was again elevated

and the patient dismissed. When next seen, two days afterwards, the tumefaction had subsided somewhat, and the Dr. was struck with the peculiar conformity of the joint, but an inquiry did not suffice to elicit its real condition.

*June* 15. Nearly seven weeks after the accident the opportunity was presented me of seeing the case with my father, in consultation with Dr. Howell. The following condition was then noted, viz.: the arm hung by the side, nearly straight, but inclining slightly toward the ulnar side; the hand was supinated; accurate measurement from the styloid process indicated a shortening of about five lines; from either acromion to the condyles the distance was the same for both arms; pronation and supination were alike perfect, as was extension, but flexion could not be effected to less than a right angle. All tumefaction having subsided, and the muscles being naturally flaccid in a child so young, every condition was present for a ready manipulation and inspection of the joint. The olecranon was about half an inch above the level of the internal condyle; the thickness of the arm, antero-posteriorly, at the joint, whilst the limb was extended, was somewhat greater than that of the sound side, but not so thick as would have been the case had the coronoid been present in its proper place in the ulna; the width at the same point was normal; the biceps was tense and prominent in this position of the arm; the trochlea and radial head of the humerus were readily definable; and the arm being somewhat flexed, the detached portion of the coronoid process lying in front of the joint could be distinctly felt, and freely moved in any direction over a small space. The olecranon was also much more salient backwards in the bent position of this limb, than in that of the sound side. All of us agreed fully as to the conclusiveness of the symptoms.

Suffice it to say of the treatment of this case, that every justifiable effort was made to reduce the dislocation, without success; hoping, should we accomplish this, there would be a sufficient amount of inflammatory action excited to throw out reparative material enough in front of the greater sigmoid cavity of the ulna to maintain the forearm *in situ naturali.* Failing in this, we were obliged to dismiss the case as incurable; feeling less reluctance, however, in so doing, in consideration of the great amount of usefulness yet left to the boy, in the unimpaired pronation, supination, and extension of his arm.

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ART. X.—*Notice of the Yellow Fever as it occurred at Key West and in the U. S. East Gulf Blockading Squadron, in* 1862. By G. R. B. HORNER, M. D., Fleet Surgeon.

AFTER many days of hot weather, the thermometer ranging from 84° to 87°, it was reported on the 29th of July that three of the workmen at Fort Taylor had died of yellow fever; then, day after day accounts were received of the disease prevailing among the labourers, mechanics, and soldiers at the fort and barracks, on the northern side of Key West. The fever became particularly prevalent and fatal among persons employed in the construction of a new fortification between the back of the fort and the inlet, these persons being exposed to the intense heat of the sun. But I have

ascertained that the very first case of the disease which occurred at Key West was on board the English bark Adventure, which arrived in distress early in July. That case proved fatal, and the deceased was interred on the 6th, as shown to me in the accounts of Mr. Davis, carpenter and undertaker. The next death, agreeably to his record, and the statement of Mr. Murray, steward to the engineers' hospital, was that of a cook, named Goodman, who died July 27, and came there from a steamer. These cases, however, appear to have been sporadic, and to have had no connection with the multitude of subsequent cases. The first of the epidemic cases, which appeared on board ship and in the harbour, were, so far as I can learn, in an American bark, the Sparkling Sea, laden with bricks for the fort, and at anchor a short distance from the new fortification. Her whole crew became affected, and probably owing to the want of early medical attendance five out of six died at the Marine Hospital, where they were sent in the last stages of the fever.

The first case of it which came under my notice was that of a young black refugee, William H. Talbot, of the San Jacinto, who had some days previously to July 26 been for part of a day in town. In the evening of that day he complained of a diarrhœa and griping, and was given two doses of laudanum. The next day he was very weak, had stupor and involuntary stools, and fever, which seemed to be typhoid. On the 28th he was sent to the Marine Hospital, was seized there with black vomit, and died on the 30th. On that day and the preceding five more cases occurred in that ship. The second case was that of Daniel J. Dresscoll, who died at the hospital with the vomit August the 1st. Among these cases was also that of Mr. Howland, master's mate, who the day before while exposed to the sun on shore, was seized with such severe headache and vertigo that he was near falling in the street. At the same time he partly lost his sight, and when he got back to the ship, had high fever with flushed face; full, strong, rapid pulse; a continuance of headache and constant nausea, without ability to vomit until given a solution of tartar emetic. He afterwards took a cathartic—the neutral mixture—and subsequently quinia. He was then sent to the hospital, where he recovered, but his eyes continued jaundiced for weeks.

By the 1st of August eleven cases of the fever had occurred in the San Jacinto, and as it was plain they would continue to appear as long as the ship continued at Key West, Rear-Admiral Lardner, at my recommendation, ordered her to proceed north, and shifted his flag to the St. Lawrence, which had been lying at Key West, with the exception of a short cruise, since the month of May. On the 2d of August he went on board the latter vessel, with his staff. Soon afterwards I found that Albert Kerscher, a tall young German and sergeant of marines, was being treated, with two others of her crew, for bilious fever, having been taken on the sick list for it on the first of the month. As soon as I saw him I became convinced from the dark-red glazed appearance of his eyes—the low type of the

fever—and other marks, that he had typhus icterodes. He died on the fourth in a comatose condition. Afterwards I formed the same opinion of the other two cases, though both got well. On inquiry I learned that Kerscher had been in the town some days before he had the fever. No case occurred in the frigate after the three preceding cases until the 12th, when master's mate Theophilus Griffith was attacked severely, with well-marked yellow fever. On the 14th and 15th two faintly marked cases appeared, but they were such from the patients having so deadly a dose of the poison that their systems had no power of reaction. The first case was treated first for constipation and then debility; the second case for nephritis, from the intensity of pain in the loins. The true nature of their disease was made known to me by their comatose state, low frequent pulse, injected sallow eyes, and the dingy-yellowish colour of their skins. One also had sordes about the teeth. He was sent to the hospital, had the black vomit there, and died on the 22d; but the other case had none, and died on board ship upon the 16th, the day after he was put on the sick list. His habits were intemperate, he became pulseless long before death, and no reaction whatever took place during his illness. By the close of August the fever had become epidemic in the St. Lawrence, and 38 cases had occurred in her. During September the weather continued sultry—rain fell in showers for twelve days; the thermometer was only one day as low as 81°, it averaged nearly 85° the whole month, and 84 cases of the fever took place. During October the weather became less hot and wet, and only 18 cases occurred. From that time the number varied, and the disease assumed a milder type. In November there were only 16 cases, in December 11, January 21, February 5, March 11, April 3, and May 4—total 212; of which 36 died, or 1 in $5\frac{32}{36}$; a part died in the ship and the rest in the marine hospital.

During the prevalence of the fever in the St. Lawrence it infected many other men-of-war and merchant vessels at Key West, but chiefly those which were lying by the wharves for coaling, or delivering and taking in cargoes. I learned the names of twenty-four of these infected vessels, some of which, as the Cuyler, and Rhode Island, became so at the U. S. naval wharf and depot. The former was at the wharf only about thirty-six hours. The Huntsville, Dacotah, Tahoma, and Morganton suffered in like manner. The U. S. armed corvette, James L. Davis, was the last man-of-war infected. She arrived at Key West on the 29th of October, and anchored about a quarter of a mile from the town. On the 15th of November two cases of yellow fever happened in her; these were sent to the hospital, and got well. But 17 more cases occurred in her at sea and on the western coast of Florida, where she was forthwith dispatched at my recommendation, and of these, two ended fatally.

In the Huntsville, the first person affected with the fever was Lieut. Commanding Wm. C. Rogers, who had been frequently on shore. Soon

after his recovery the ship put to sea, but returned in eight days, the disease having become prevalent in her, and proved fatal to two officers, Acting Paymaster E. D. Burton, and Acting Assistant Surgeon G. D. Gould, both very estimable young men, and to one man. The fever subsided in her a short time after she returned, but soon reappeared and made a victim of Mr. Rose, her chief engineer, who told me he had had the yellow fever at New Orleans seven years previously. Second attacks occurred to a number of other persons in the squadron, and likewise to citizens; the Rev. Mr. Herrick, of the Episcopal Church in Key West, who had the fever there in 1857, was attacked. In the Tahoma, only one case of it appeared, that of Acting Master Henry A. Hurley, who died. The disease attacked the crew of the Dacotah after she left port. She immediately returned to it; fifteen cases occurred in her, and though mostly very mild, at the recommendation of Surgeon Bloodgood, approved by me, she was dispatched to the Atlantic, and more cases of the fever occurring, she went to New York, where three of them proved mortal, as I learned from Captain McKinstry, her commander, but none on the passage. In the Magnolia, the first cases also happened at sea, others at Key West, at intervals, and three died. The Cuyler arrived there from Boston on the 20th of August; on the eighth day afterwards I found her medical officer, Acting Assistant Surgeon W. Argyle Watson, affected with some slight symptoms of the fever—suffused eyes, furred tongue, some sallowness, frequent pulse, and languor. Her worthy and intelligent commander, Lieut. Francis Winslow, though he valued his surgeon's services much, as no other cases of fever were on board, and he was certain of meeting the Huntsville at sea and getting her medical officer if wanted, put to sea immediately, on a cruise. But the fever becoming epidemic in the Cuyler, she made for Boston, before reaching which Lieut. Commander Winslow died of the fever, and Acting Lieutenant J. Y. N. Philip became affected with it. He died shortly after her arrival, but I have not heard of any more deaths in that vessel. For similar reasons, of a more urgent character, it became necessary that the St. Lawrence should also depart to some northern port, but she was the only suitable vessel for a flagship on the station. Dr. Pearson, my only assistant surgeon, had taken the fever, was unfit to take charge of the sick, and my own services in the squadron could not be spared to go home in her. For these reasons she remained at Key West, and continued to be afflicted with yellow fever. But in November it was of milder type, both in the harbour and on the island. No death occurred among my cases after one on the fifth of that month, and the deceased was known to have been a hard drinker. Indeed, such had been the fatality of the fever among topers, that unprofessional persons would prognosticate correctly the termination of the disease, according to their knowledge of the habits of the patients. Those too who were scorbutic, of dark bilious complexions, and subject to local disorders, were the greatest sufferers.

As a class, our marine guard of forty men, who were mostly young northern men, lost the largest number, ten of them having died of the fever. Many of the guard were Germans and Irishmen. The least liable to this, were the boatmen of the ship, who were little in her, were constantly during the day rowing in the open air, and were young vigorous men. In the whale boat, which took me on shore and from vessel to vessel, of 13 men, including the coxswain, only two got the fever; one of them was Samuel Gail, of Philadelphia, who was very sallow, though stout, and died comatose. The other did not take the fever until the 2d of January, and after he had left the whale boat. Persons much confined to the ship, and among the sick, were infected in large proportion. Her paymaster, J. P. Oliphant, his clerk and steward; the surgeon's steward and two regular nurses, and Dr. Daniel Thacker Lewis, resident physician of the Marine Hospital, became victims; and my three very able assistant surgeons had the fever—Assistant W. K. Vanreypen, at the hospital, Assistants Pearson and Shirk, in the St. Lawrence. Dr. Lewis was taken sick on the night of August the 23d, after great fatigue and much watching at night; had the fever of a high type, suffered much pain in the loins, left the hospital after the fever subsided, seemed to have a good chance of recovery, but was seized with black vomit and stools, and died on the 3d of September. As soon as he was taken sick, Collector Charles Howe applied for a surgeon to the hospital. I volunteered my services August the 24th, took charge of it, and was enabled to see the fever as it affected persons from other men-of-war than the Jacinto and St. Lawrence, and also merchant seamen, and some other civilians who had not fled like a host of mechanics and labourers from the island to escape the pestilence. Of these cases there were 54 altogether, and of them 14 originated in the hospital. Two went there well, and 12 had gone for other complaints. But it was a subject of regret to me that owing to the want of a room or dead-house, until I lately had one built, the rapid decomposition of the dead, and my want of time, I was not able to make any post-mortem inspections.

*Symptoms.*—With very rare exceptions persons when taken with the fever complained of severe pain in the forehead and loins—but oftenest in the former—and sometimes extending down the legs. The eyes were suffused, glazed, injected; the skin was warm and dry; the tongue moist, furred, white, and red at the tip and edges; the bowels bound; urine scanty, straw-coloured, sometimes dark brown, albuminous and frothy, in some patients; and in one so much so as to remain in bubbles for hours. In this case, and in another, it was exceedingly dark brown and tinged with saffron. So dark was this colour, in one case, as to stain all unpainted wood on which it fell. Ordinarily no nausea existed, but in bad cases the stomach was irritable at an early period, and then vomiting, first of the ordinary contents of the stomach, occurred; afterwards there was sometimes a

greenish or brownish fluid ejected, and in fatal cases, at last, the peculiar coffee ground liquid more or less distinct. The most perfect specimen of the latter was from a merchant seaman, the granules being very distinct, dark, regular in size, and floating in a transparent fluid, so that when scattered over the floor they seemed to have come from the washings of a coffee-pot. In some cases the tongue, on the second or third day, became thickly loaded with white fur, sometimes tinged yellow; and in the severe cases this fur became dark and dry. In others the fur disappeared, and the tongue looked like raw flesh more or less dried. The alvine evacuations were usually of an olive hue and healthy appearance, but in fatal cases sometimes resembled the vomit. The mind at first also frequently became stupid; délirium and coma occurred in severe cases, and convulsions immediately preceding death happened in several. In one case raving mania began the attack. The pulse was uniformly frequent, ranging from 90 to 130, regular, full, and sometimes strong. But at the end of forty-eight hours it commonly sank, lost force, fulness, and frequency, and by the third day was down to 70, and often as low as 60 in the minute. In several cases it sank below 50, and in one instance down to 42.

The cases from merchant vessels were commonly from neglect in the first stage, much more severe and fatal, nearly all dying. In one case, that of Benedict Janson, from the Huntsville, the tonsils became so swelled as to threaten suffocation, and required repeated lancing and the application of lunar caustic. His body also became covered with a vesicular eruption. This patient was cured, and returned to the vessel, but a week or two afterwards got wet at sea, relapsed, and died. The same mishap occurred to Andrew McAvoy, another of her crew, who was admitted into the hospital with the fever on the 22d of August; discharged when well, Sept. 1st; eat a young cocoanut which induced colic, relapsed, and died at the hospital with the black vomit on the sixth. R. M. Parker, a young Philadelphian, who had long suffered in the St. Lawrence with diarrhœa, was seized with the fever of a very severe type, was sent to the hospital, and died on the fourth day of his admission, with the vomit and copious bloody stools. But the rarest case was that of George Dean, also a young man from the above ship. He had yellow fever of so low a form, that when it subsided he was cold, covered with a clammy sweat, and nearly pulseless. To produce reaction, rubefacients, sinapisms shifted from part to part, and stimulants, including the volatile julep, were used. Tonics were subsequently given, and in a short time he began to convalesce. But his eyes and all his skin became of a saffron hue, and continued so for weeks; the skin likewise became covered with a small papular eruption, and in every pimple, by the use of a microscope, a small vesicle filled with a watery fluid was discovered. After some days a few of the vesicles on his chest became about half the size of a common pea, and filled with a yellowish fluid. His urine was somewhat albuminous, as dark as French brandy, and so deeply

tinged with bile that it stained the floor a saffron hue. This patient grew well, but was thirty-eight days in the hospital. Another patient, a seaman, had urine of a light colour, and so albuminous that it remained in bubbles for a long time after discharged. Finally, a marine from the St. Lawrence, William Regan, and two merchant seamen, died in the hospital with profuse hemorrhage from the nose, mouth, and stomach.

*Causes of the Fever.*—Some persons of Key West ascribed the late epidemic to the Adventure, the brig which arrived there from Havana in the first week of last July. She, I heard, had two cases, one of which died at the marine hospital; but as the cases which occurred in the island, and other vessels did not appear until the latter end of the month, and as connection was discoverable between them and the cases in the Adventure, there is no good reason to believe that the fever originated from her. On the contrary, I believe it was generated on the island which has been afflicted with it from the time it was resorted to by Commodore Porter's squadron, about forty years ago. Though the disease rarely prevails among the natives or long residents, a lady who had resided there for ten years assured me she had never known a year to pass without some cases occurring, though the fever was rarely epidemic and had never been so much so as last year. Though Key West has been partly cleared of trees and bushes, and a number of hollows have been drained of stagnant water; yet I found twenty-two of these of various sizes, which, during the rainy season—the close of summer and the beginning of fall—were more or less filled with water, marsh-weeds, and aquatic plants. These hollows are contained in a circuit of two or three miles; some are within the southern part of the town and all between it and the south side of the island; nearly all its eastern half is level, and partly swampy, and overgrown with evergreens and bushy trees in watery places. The most of those near the town are covered with woody nightshades, some of which attain a height of eight or nine feet. At all times the southern and eastern shores are partly covered by dead sea-weeds and grass, and after strong winds the above plants, fresh and old, intermingled with dead zoophytes, are heaped up in putrefying masses, which attract the numerous buzzards hovering over the island. The high temperature of the air and frequent, copious showers cause the decomposition of these vegetable and animal substances. But the most abundant sources of malaria generating the fever are the hollows in the southwestern part of Key West, back of Fort Taylor, and the low ground, or rather flat conical rocks overgrown with weeds, extending northward from the largest pond called Lake Como to the hospital. Back of this, also, is a hollow, which last year was partly filled with fresh water and mud. This hollow may have been one of the sources of the fevers which originated among the inmates of the hospital. But I think it more probable that the malaria from the mud ponds and low grounds above mentioned were the chief causes both of the fevers in the hospital and among the labourers at Fort Taylor, as the first cases on the island occurred among them. I knew of two

children who lived near two of those ponds, having had the fever; and nearly all the cases which occurred among patients sent to the hospital for other complaints, were located in the lower and at the southern end of the hospital, when they were seized with the fever. Moreover, in that part no other cases of it were treated, and the Gem of the Seas, the San Jacinto, and Saint Lawrence, the first vessels infected, were anchored abreast of the low grounds, and so near to the adjacent ponds that the east and southeast wind which prevailed before and after the fever began, blew directly over the land and vessels, thereby wafting to them whatever malaria may have been accumulated over the ponds and low grounds.

Among the predisposing and exciting causes of the fever the principal, were the habitual use of alcoholic drinks; indigestible, irritating, and stimulating food; exposure to spray, currents of cool air; excessive labour; or scorbutic diathesis and depressing passions, especially fear of the disease. A combination of some of the above named causes sometimes happened. In two inebriates fear seemed to be the chief exciting cause, and in one very temperate person it was thought by some of his shipmates to be the sole cause of the attack. But he got well, and the two former died.

As prophylactics we recommend the avoidance of all the above mentioned causes, and particularly of fatigue, exposure to the sun when very hot, and intoxicating liquors. Though smoking tobacco has been recommended as a preventive of yellow fever, I have never had reason to think it such, and have, on the contrary, seen so many smokers affected with the disease that I believe that tobacco, either smoked or chewed, predisposes to an attack. Indeed, there appears to be a very great resemblance between the action of narcotic acrid poisons and the poison causing yellow fever, though the countenance of patients suffering from it is more like that of persons intoxicated with some kind of ardent spirits, the eyes of the patients at first being precisely like those of a man who has been engaged in a night debauch. In the last stage of fatal cases the eyes are of a dirty yellow colour, like those of confirmed sots. The poison of this fever, in other respects, is manifestly possessed of similar qualities to alcohol and some less stimulating narcotics. In the yellow fever the brain is as plainly affected as by any of them, as shown by the injected eyes, stupor, delirium, torpidity, prostration, and sometimes spasms. But the invariable pain in the forehead and redness of the eyes indicate that the anterior part of the brain and the thalami nervorum opticorum are chiefly affected. The irritation of the latter causing the optic nerves and bloodvessels to sympathize, and the eyes of the patients to be like those of persons who have just had a night debauch.

The frequent affection of the stomach, liver, and kidneys, seems to be merely incidental, and attributable to those organs being predisposed to inflammation from improper articles of drink and nourishment, or to these having been taken in excessive quantities. Exposure to great heat is likewise one of the exciting causes of liver affection.

# TRANSACTIONS OF SOCIETIES.

## Art. XI.—*Summary of the Proceedings of the Pathological Society of Philadelphia.*

1862. *April 23. Case of Embolism.*—Dr. Hutchinson exhibited a common iliac artery, in which an embolus had become impacted, and read the following history of the case from which it was derived.

Mary Ann McGuire, aged 11 years, first came under my observation as a patient of the Dispensary of the Moyamensing House of Industry, where she was brought by her mother, who said that the child had been suffering with disease of the heart for some years. As is usual among patients who seek relief at public charities, a very imperfect history of the case only could be obtained. It did not, however, appear that she had ever had any disease in which organic changes of the heart's structure occur as a frequent complication.

The following was the result of a careful examination. A purring sensation was communicated to the hand applied over the precordial region, while percussion revealed the presence of hypertrophy, and auscultation a blowing murmur heard best at the apex and with the first sound.

The child continued to come at regular intervals to the dispensary, evidently improving under the treatment adopted.

*March* 4. I was requested to visit the child at her home, upon doing which, I found that a most remarkable change had taken place. The mother told me that on the evening preceding, the child had gone to bed in her usual health, but had been awakened at 10 o'clock by a violent pain in her right foot, which had continued almost uninterruptedly up to the time of my visit. Upon examining the foot and leg, I found the temperature of both to be very much below that of the other side, there being an abrupt transition from the normal heat of the thigh to its almost complete absence at about the level of the tuberosity of the tibia; also inability to raise the limb without assistance, and that the child complained of sharp shooting pains occurring in paroxysms, which were referred to the points of distribution of the nerves of the leg. I found, moreover, that there was increased sensibility, and that no pulsation of the dorsal artery of the foot, of the posterior tibial or popliteal arteries could be discovered. The position of the patient prevented me from satisfying myself in regard to the condition of the femoral.

I made the diagnosis obliteration of an artery, I thought the femoral, by an embolus; and I was induced to make the diagnosis by my knowledge of the previous history of the case, the suddenness of the seizure, the almost post-mortem coldness of the limb, the intense pain occurring in paroxysms, and the absence of pulsation in the popliteal artery.

The treatment consisted in the external application of warmth, and in the exhibition of general and local anodynes.

*5th.* No change presented itself to my notice this morning; the suffering during the night must have been intense, as the cries of the child were heard at a distance of half a square.

*6th.* During the night the child's sufferings were so great that the father sent for a physician in the neighbourhood, whom they afterwards determined to retain. Not wishing to lose sight of the case, I asked and obtained permission to see the child occasionally. The treatment adopted by my successor did not materially differ from mine, and like it, failed to afford any relief.

*7th.* There does not seem to be any effort made to establish the collateral circulation. Two grains of sulphate of morphia had been prescribed without affording relief, or inducing sleep.

*13th.* I carefully examined the foot to-day, and found that when I pinched a toe, the child was unable to say which had been touched; and that in regard to the rest of the foot there was entire inability to localize the point of contact. This absence of the sense of touch reached to the malleoli; above this point the application of any body produced pain.

*16th.* The whole foot has become a livid blue colour, there being every evidence of commencing gangrene. No heat and no sensation in the part, with great pain upon movement. Pressure made over the course of the femoral artery produces an instant scream from child; no such result following pressure upon other parts of same thigh, or upon corresponding part of other thigh. Pulse is now 132. Child very weak; appetite poor. The inhalation of a mixture of ether and chloroform was ordered, but failed to produce any benefit.

*29th.* The pain is still intense, and is still referred to foot, especially to big toe, although the whole foot is now in a condition of sphacelus.

*April* 7. The line of demarcation appears to be forming just below the knee. Child's general condition does not warrant the thought of an amputation being entertained.

*15th.* The case terminated fatally during the night of the 13th. Permission was, after some trouble, obtained, to make an autopsy.

The foot had become detached; the lower extremity of the other side was slightly œdematous; the abdomen somewhat distended. The body, considering the length of the illness, and the greatness of the suffering, not much emaciated.

The autopsy was made hurriedly, owing to the family being in a somewhat excited condition, and decidedly unwilling to allow a thorough examination to be made.

The heart was found to be dilated and hypertrophied, equalling a man's in size. The left auricle was very much distended, and contained a large grumous clot, evidently of old formation. In the corresponding ventricle was found a small one, recent in its origin. The orifice of the mitral valve was very much contracted, while the valves themselves were so thickened as to be evidently incapable of closing completely during the systole. The aorta was examined carefully from its origin to its bifurcation, but nothing abnormal was discovered. Just beyond the commencement of the right common iliac artery was discovered a clot occupying the entire calibre of the vessel and extending into the external iliac almost its entire length. It was not possible without destroying the specimen to discover the position at which the embolus had lodged; but as the external iliac was entirely patulous, it seemed to me that it must have been low down in the external iliac. None of the organs could be examined.

There can be very little doubt that the contracted orifice of the mitral valve caused a dilatation of the left auricle, with arrest of the blood which, ceasing to circulate as quickly as usual, coagulated. The clot thus formed underwent disintegration, and readily permitted a small portion to become detached, and to be carried into the general circulation. I was right, therefore, as to the nature of the lesion, but wrong in regard to the position of the clot, being misled by having perceived at various times a slight pulsation in the groin.

*Nov.* 26. *Case of Multiple Aneurism.*—Dr. W. F. NORRIS presented the following report of this case:—

Thomas Ridgeway, a mulatto, æt. 55, was admitted into the Pennsylvania Hospital 6th mo. 15th, 1862, presenting the following symptoms. On the right side of the body immediately behind and above the sternal end of the clavicle was a small pulsating tumour with a well-marked thrill and loud bruit, and in the axilla a larger tumour (about the size of a hen's egg), which also presented the usual characteristics of an aneurism. There was also a large aneurism in the popliteal space of the left side. His history is as follows: Seven months ago he first experienced pain and partial loss of power in the right arm, and one evening when rubbing it noticed the tumour. In the same way his attention was drawn to the popliteal aneurism, eight weeks previous to his admission. Up to this time he did hard work as fishmonger on the wharf, frequently lifting halibut and other heavy fish.

He has constant and severe pain in the thigh, leg and foot, and occasionally also in the arm and hand. The popliteal aneurism steadily increased, the pain becoming more and more intense until 8th mo. 5th, when the sac of the aneurism appeared to give way; the leg swelled enormously, and on the 10th the foot became gangrenous. Since his residence in the house another small aneurism has appeared just below the axillary one; it is about three-quarters of an inch in diameter. The gangrene continued to spread, finally reaching the knee. There were frequent small hemorrhages, caused apparently by the ulceration of superficial veins, which, however, always yielded *pro tempore* to pressure from dry lint and a bandage. The treatment consisted of a full diet, and the free administration of opiates and stimulants, notwithstanding which he rapidly sank, and died on the 21st.

An *autopsy*, seven hours after death, showed an enlarged, pale and softened heart; the arch of the aorta and all the arteries springing from it dilated considerably beyond the normal size, and their coats thickened; a small aneurism (about one and a half inches in diameter) in the right subclavian. In the course of the axillary artery was a large aneurism (about three inches in length) over which the nerves of the axillary plexus were spread out and to which they were attached. Immediately below this, in the brachial, was another small dilatation, about three-quarters of an inch in diameter.

No satisfactory dissection could be made of the popliteal aneurism on account of the advanced state of gangrene of the part.

1863. *Feb.* 18. *Chronic Arachnitis; Death from Effusion, etc.*—Dr. JOHN ASHHURST, Jr., read the following history of the case:—

Levi D. Kistler, of Co. H. 96th Pennsylvania Regiment, admitted to U. S. A. General Hospital, Chester, Pa., August 12, 1862, suffering from

diarrhœa and debility. He was thin, and soon became still more emaciated. This fact, and the peculiar hue of his complexion, gave rise to the suspicion that he might be affected with diabetes mellitus, but an examination of his urine answered this question in the negative. His mind occasionally wandered a little at night; but attention was not specially called to the condition of his brain until the afternoon of Sunday, August 31st, when he suddenly became violently delirious, so that it was necessary to place him in an isolated apartment, and to employ mechanical restraint to prevent him from injuring himself and those about him. This mental condition (with occasional semi-rational intervals) continued until his death, which occurred about midnight on the 29th—30th of September. The morning before the delirium began, numerous petechiæ were observed over the abdomen. These increased in number, and at the end were to be found also on the thorax and limbs. About ten days or two weeks before death the cornea of the right eye became opaque and staphylomatous without obvious cause, and the mouth was drawn to the right side. Death at the last occurred rather suddenly.

An *autopsy* was made twelve hours after death, with the following results: Rigor mortis well marked; petechiæ over several parts of the body, and the skin of the abdomen had already assumed the green hue of incipient decomposition.

*Cranium.*—The meningeal vessels much enlarged and engorged; large amount of subarachnoid effusion; lymph, not very recent, gave evidence of arachnitis, but no appearance of tubercle was detected. The brain substance presented red points, such as are supposed to be characteristic of concussion of the brain, and such as are frequently found in cases of acute alcoholic poisoning.

*Thorax.*—Lungs, posteriorly much engorged, the condition constituting almost hypostatic pneumonia. The lung substance, however, floated when thrown on water. The bronchial tubes filled with a frothy mucus. Old adhesions, slight, however, of the left pleura; the right entirely free. The heart small and rather pale; in the ventricles large fibrinous clots were found in proximity to the valves; the mitral valve slightly thickened; pericardium healthy.

*Abdomen.*—Liver slightly enlarged, and presenting an appearance approaching to that known as "nutmeg liver." Spleen lobulated; healthy. Kidneys somewhat pale. Mesenteric glands much enlarged, but of normal consistence.

The co-existence of petechiæ with fibrinous clots in the ventricles has been remarked in two cases reported by myself to the Society on previous occasions.

*March* 11. *Ovarian Dropsy. Fibrous Tumour of the Uterine Wall inclosed in a Bony Shell.*—DR. PACKARD exhibited a specimen of this character, and read the following history of the case from which it was derived:—

Mrs. M., æt. 55, was first seen by me in the fall of 1860. She had borne three children, one still-born and two living, and had a miscarriage 23 years before. She began to swell about 17 years since, chiefly on the left side.

I was called to see her by her physician, Dr. Keating, who desired that I should tap her for abdominal dropsy, which had become a source of great distress to her, from the immense weight of the liquid accumulated,

and the interference with her breathing. Her abdomen was very large, equally distended, the cutaneous veins not much swollen; the umbilicus was, as usual, very low down on the tumour. Her urine was small in amount, and of a dark slaty colour—I do not know that any analysis was made of it. She had no anasarca, nor any other sign of disease of the heart, lungs, liver, or kidneys.

On the 8th of November I tapped her; the first entry of the trocar was made in the median line, and as the liquid flowed away, it became apparent that there was a congeries of cysts, probably, of course, ovarian. Another puncture was made on the right side, and still another on the left: the liquid drawn off from this last puncture was thick, grumous, and reddish, being like that from the other points, except in the admixture of blood with it. The entire quantity of liquid drawn off amounted to about twelve gallons. She had no faintness of any consequence either during or after the operation, and continued to enjoy a tolerable degree of comfort for about 18 months. Her urine, however, remained scanty, and obliged her to use diuretics constantly.

On the 24th of August, 1862, Dr. Keating being absent in Europe, Mrs. M. sent for me, and told me that her discomfort from abdominal enlargement was again becoming intolerable. Her condition was very much the same as before. For various reasons, the operation of tapping was postponed from time to time until Oct. 21st, when it was performed. Again she went through it very well. Four punctures were made at different points, where the cysts seemed to be most prominent; a less quantity of liquid was drawn off than on the former occasion, and it was more generally mixed with blood. Her comfort was greatly increased by the tapping; she did very well for three days, and seemed in a fair way to be up again soon, when she suddenly sank and died.

At the *autopsy*, the whole abdomen was found filled with enormous cysts of ovarian origin. A very large quantity of bloody liquid still remained, and some cysts of comparatively small size were intact. The appearance was that of excessive hypertrophy of the ovaries, the cystic element also acquiring an undue predominance over the fibrous stroma. One of the large cysts contained a quantity of air.

The uterus was very much enlarged, its neck being especially developed; in its anterior wall was contained an interstitial tumour, about as large as a small lemon, having a bone-like shell with dense fibrous contents; another small fibrous tumour was situated close by. There was a polypus at the uterine orifice of the left Fallopian tube, and another, crest-like in shape, at the side of the cavity near the neck.

All the other viscera were healthy.

*Spotted Fever.*—DR. PACKARD gave the following account of a singular case of disease recently observed by him.

E. F., æt. 19, a young girl in comfortable circumstances, employed in a manufactory of postage-currency notes, retired to bed in her usual health at 11 P.M., Feb. 19th, 1863. Next morning, at 7, she complained of headache, chilliness, and pains in her back and limbs. A brother about 13 years of age being very ill, she was not much noticed until after his death, which took place about 2 P. M.

I saw her at about 3 P. M. She presented symptoms easily accounted for on the supposition that she had taken a heavy cold, aggravated by

the distress occasioned by the illness of her brother. I ordered an anodyne febrifuge mixture, a hot foot-bath, and warm drinks.

At 6 P. M. she was in much the same condition.

At 10 P. M. her pulse was 160, her tongue was white and furred, and her throat somewhat sore, although displaying no abnormal appearance. Her hands and arms, and her body, were pungently hot, while her legs and feet were cold. She lay in a semi-stupor, unless when asked a question. Active stimulation and support were ordered, and counter-irritants externally, with a mixture containing aq. camph. f℥ij; liq. ammon. acet. f℥iij; and tr. veratr. vir. ♏lxxx; to be given in f℥ss doses every two hours.

She was unconscious all night, and on the 21st, when Dr. J. F. Meigs saw her with me, at 8.45 A. M., she was evidently dying. Her pulse was gone, and her surface becoming cold. Dark bluish-purple spots of varying size, generally very small, were scattered over the face, arms, and body. The lower extremities were covered with irregular pale bluish patches and streaks, as if from bruises.

She died at 11 A. M., "after a hard struggle," as I was told.

Dr. Meigs and myself made an examination of the body 21 hours after death. Body frozen; well formed, not very fat, but sufficiently so. Head not examined.

*Thorax.*—Lungs perfectly healthy; some hypostatic congestion. Nothing abnormal about the heart; some firm clots and a good deal of fluid blood in both sets of cavities, the clots being in greater quantity on the right side than on the left. About f℥j of turbid serum was noticed in the pericardial sac.

*Abdomen.*—Liver healthy. Gall-bladder distended with green bile.

Stomach distended with gas and greenish-yellow liquid; its mucous surface normal. Peritoneal coat of stomach, as well as of small intestines, spotted here and there with purplish-blue maculae.

The mesenteric glands were much enlarged, and those corresponding to the lower part of the ileum were injected. Peyer's patches were enlarged and thickened, and one or two of them, some distance from the ileo-colic junction, decidedly injected.

Both kidneys were intensely congested, but otherwise healthy.

The spleen and pancreas were normal.

Bladder empty.

*Bursal Tumour producing Loss of Power of Forearm.*—DR. AGNEW presented the specimen, and made the following remarks:—

The tumour was about the size of a hickory nut, and was situated at the bend of the left arm, on the inner side of the tendon of the biceps muscle. Patient a female. It had been growing slowly for two years, was elastic to the feel, and exquisitely sensitive. The power of the flexor muscles of the fingers and thumb, and the extensors of the forearm generally, was so much diminished as to render the limb comparatively useless. The tumour made but little show externally, being bound down by the deep fascia of the arm, and in flexion and extension of the arm appeared to follow the movements of the tendon of the biceps muscle. I regarded it as of bursal origin, and accounted for the muscular phenomena from either contiguity or attachment to the nerves inclosing the muscles involved.

In its removal an incision was made through the skin directly over the growth, the median basilic vein pushed aside, the laminae of cellular tissue divided on a director, and the bicipital aponeurosis opened, when the tumour

came into view, when, on a careful inspection, it was found to have the median nerve investing its anterior surface spread over it in a membranous form, and likewise adherent. This was carefully dissected away, and, on turning out its deep surface, a similar, though not so extensive connection was found to exist with the posterior interosseous nerve. A single narrow prolongation alone retained the growth, which descended beneath the tendon of the biceps muscle to the bursa situated between it and the tubercle of the radius.

The history of its formation might doubtless be stated as follows: A few fibres supporting the bicipital bursal membrane had yielded under some strain, allowing the latter to bulge through, and to increase gradually in size by the accumulation of fluid. Subsequently, the tumour became solidified by inflammatory products becoming organized.

The tumour contained no fluid contents, but consisted of formation of fibrous or connective tissue in various stages of development. The recovery was most satisfactory, the lady having very soon regained the use of all the muscles implicated.

*Case of supposed Typhus Fever, death occurring on the third day; Hypospadias.*—Dr. ASHHURST reported the following case of this:—

W. W. Fenno, private, Co. K, 145th Regiment Pennsylvania Volunteers, entered the Germantown U. S. A. Hospital on December 14, 1862, suffering from chronic rheumatism with debility. After some weeks he was detailed for duty with Hospital Guard, and continued to serve with that body until within a few days of his death. On Tuesday, February 17th, 1863, he complained of slight diarrhœa, which had lasted for some days, and annoyed him. He appeared, however, as well as usual. The next day, Wednesday, he was found in bed with a high fever, flushed face, rapid pulse, quick breathing, and dry and darkly furred tongue. In the evening his condition was much the same. He denied having experienced any rigors, though a tremulousness in his voice and motions several times suggested the inquiry. The next day, Thursday, he was evidently suffering from, and apparently far advanced in, the course of a low nervous, congestive fever, which more resembled typhus than the enteric or typhoid. His dyspnœa was greatly increased. Auscultation showed great congestion of the lungs posteriorly, without, however, any positive inflammation. Great hebetude of mind, from which, however, he could be temporarily aroused by a question in a loud tone of voice, had replaced the nervous jactitation and excitability which existed the previous day. His belly was quite tympanitic, and the capillary circulation over the whole body very feeble. No "tache" or eruption of any kind could be found by the most careful examination. From this time he became steadily worse, each visit rendering more certain the unfavourable prognosis which had already been formed.

On Friday morning, the third day only since the first manifestation of the disease, he was evidently moribund. Hebetude was rapidly deepening into coma, congestion giving way to carnification, and retention and suppression of urine were added to complicate his condition. About 1.30 P. M. he was seized with an attack of vomiting, during which he discharged from the mouth a large round worm (*Ascaris lumbricoides*). Delirium and extreme restlessness alternated with his comatose condition, until his death, which took place about 4 P. M.

An *autopsy* was made nineteen hours after death, with the following results: Rigor mortis strongly marked; excessive lividity of the depending

portion of the body; over the epigastrium a group of petechiæ, which the nurse declared to have existed before death; no vibices whatever.

Thorax and abdomen only examined. Pleuræ on both sides entirely free from adhesions. Both lungs congested very much posteriorly, but crepitant throughout. Heart and pericardium healthy; the left ventricle filled with black fluid blood, the right ventricle containing two fibrinous clots. Liver rather large; healthy. Spleen very much enlarged and lobulated. Kidneys healthy. Intestines presented no glandular disease whatever.

The absence of organic lesions in this case may be attributed to the short duration of the disease, which seems to have struck principally at the nervous system.

This patient presented a well-marked case of hypospadias. The opening of the urethra was to the right of the raphé, and immediately below the frænum. A mere depression existed in the glans penis, at the usual point of opening of the urethra.

*April* 22. *Tumour.*—Dr. PACKARD exhibited a tumour about the size and shape of a lemon, removed by him from the upper and back part of the thigh of a robust man æt. 45. The patient had first begun to suffer from numbness and swelling of the left leg and foot about two years since. About sixteen months ago he discovered a small swelling just under the lower edge of the gluteus maximus, and this lump had continued to grow slowly and steadily. For about eight months previous to the operation he had been unable to remain in bed at all, the uneasiness caused by the pressure of the tumour on the sciatic nerve being so great as to compel him to resort to incessant change of posture. His general condition was good.

The operation was done on the 17th of April, in presence of Drs. Norris, Peace, J. Pancoast, W. H. Pancoast, and Boker. The patient being thoroughly etherized, an S-shaped incision was made, and the tumour readily enucleated after the lower fibres of the gluteus maximus had been carefully divided. Three small arteries required ligation. The tumour, which consisted of fully developed fibrous tissue, seemed to have no decided attachment to any of the adjacent structures. Iron-wire sutures were used to close the wound. All the symptoms due to pressure on the sciatic nerve disappeared at once, and the healing of the wound took place as favourably as could be desired.

(*May* 9. This patient may be considered as absolutely well, although his leg has not yet fully recovered its strength, and swells, probably from relaxation of its vessels, after he has walked any distance, or stood up for a length of time.)

*Ovarian Cyst; Atrophy of the Uterus.*—DR. PACKARD exhibited this specimen, removed by him *post-mortem*, from a patient of Dr. J. C. Morris.

The patient, Mrs. K., æt. 68, had had an enlargement of one side for many years. About two years since she was a good deal troubled with pain, which she thought to be colic. On Dr. M.'s seeing her in December last, the umbilicus was depressed, and fluctuation was perceptible, although not very marked, on the right side of the abdomen. Simpson's sound seemed to pass about 5 inches (!) into the cavity of the uterus. The diagnosis made out was of ovarian dropsy, and the treatment adopted was simply palliative.

On account of the extreme embarrassment of respiration, tapping was performed March 11th, nine pints of very fetid, ropy, sanguinolent pus

being drawn off; the tumour was not, however, reduced more than one-half.

She gradually swelled again until about a week before her death, her general health declining. On the 12th of April an abscess broke about two inches from the point where the tapping had been done, discharging a very large quantity of yellowish ropy fluid, of a most sickening odour.

She died exhausted, April 15th.

The *autopsy* was made on the 16th. On opening the abdomen, a very large thick-walled cyst, deep bluish externally and nearly black on its inner surface, filled with a thick puruloid liquid, of most nauseous odour, was found adhering to the anterior wall. This had contracted adhesions to the omentum and intestines, and had drawn up the uterus so as to bring this organ and the vagina into a straight line. One of the Fallopian tubes, the left, had upon it, near the uterus, a dilatation; it was this tube which was connected with the diseased ovary in which the large cyst above mentioned had its origin, and which, being drawn up into a straight line with the uterus and vagina, admitted the uterine probe so as to simulate enlargement of the uterus. The latter organ was extremely soft, and the substance of its walls very much less in quantity than in the normal condition. The other ovary was also affected with cystiform disease.

The heart was excessively fatty—the liver somewhat so. The other organs presented nothing abnormal.

*Spotted Fever.*—Dr. PACKARD mentioned that since the last meeting of the Society he had had an opportunity of examining *post-mortem* two additional cases of the peculiar epidemic lately observed here.

One of these cases occurred in the practice of Dr. John F. Lamb, of Frankford. It was that of a girl æt. 20, a farmer's daughter, who had been in good health until April 8th, when she sickened; on the 12th she died. The autopsy was made 63 hours afterwards, in presence of Dr. Lamb and Dr. Wilson Jewell; the notes of it are as follows:—

"Body frozen; it had been in ice. No rigor mortis remaining. General appearance normal; petechial spots in very small number on the front of the chest and abdomen, and on the shins in the shape of ecchymoses.

"The *head* was first examined.

"The brain and its membranes were intensely congested throughout; the brain was softened, excepting the pons varolii. An effusion of yellow serum or lymph was noticed beneath the arachnoid, between the convolutions of the brain; this existed in the spinal canal also.

"On the *abdomen* being opened, the viscera looked healthy. Some of the mesenteric glands were slightly swollen, and a few of them were congested. The mucous membrane of the stomach was at some portions very deeply injected, and here and there it was destroyed over patches of small extent. The organ contained a dark, semi-fluid, coffee-ground material, with a great many particles like broken-down blood-clot in it.

"Some of the glands of Peyer were decidedly, although not deeply congested. Those close to the ileo-colic junction were normal, the affection existing in those higher up

"The kidneys were markedly congested. Spleen pulp softer than usual.

"Liver congested and softened.

"The *thoracic* viscera presented no evidence of disease; the heart was firmly contracted upon a mass of softish currant-jelly-like clot, with a few

decolorized portions here and there. Lungs perfectly healthy; some hypostatic congestion in each."

The other case occurred in Manayunk, in the practice of Dr. J. K. Uhler. It was that of a young woman, æt. 27, who was examined by Dr. Morton and myself 72 hours after death.

The appearances were much the same as in the other cases mentioned—intense venous congestion of the brain and its membranes; congestion to a less degree of the kidneys, and to a still slighter degree of the other abdominal viscera. A noticeable feature of this case was the presence of purpureous spots on all the serous membranes, the pleuræ, pericardium, and peritoneum. It was thought by some of the gentlemen present that the clot contained in the heart was less in quantity and softer than normal.

In none of these cases, therefore, was there any special lesion to be detected in any organ. The evidence afforded so far, therefore, by post-mortem examination has been simply negative, and sheds no light on the nature of the disease.

*June 10. Case of Osteo-myelitis, with Phlebitis and Metastatic Abscess following Secondary Amputation.*—Dr. JAMES A. DRAPER related the following case, under his care, at the Chester Military Hospital, of gunshot fracture of the left humerus, received in one of the battles of the summer campaign of 1862, a portion of the ball remaining imbedded in the bone. Union had occurred, with the formation of a large ensheathing callus, but rapid ulceration of the soft parts having subsequently set in, and there being evidence of extensive necrosis, the patient at the same time failing in strength, amputation was determined on, and accordingly performed by Dr. Draper on February 16, 1863.

After two days, rigors set in, and the patient became gradually worse until he died on the morning of the 25th. The following are Dr. Draper's accounts of the dissection of the amputated arm, and of the autopsy made subsequently to the patient's decease.

Dissection of the amputated portion of the arm showed that a large amount of callus had been thrown out, uniting the fractured ends of the bone. Running diagonally from before backwards and from above downwards through this mass of callus and newly-formed bone, was a large splinter of detached bone about three inches in length. On the posterior part of the humerus, corresponding with a large opening on the posterior aspect of the arm, about half the ball was found imbedded in the bone.

*Autopsy.*—The stump and shoulder were slightly infiltrated, and the superficial veins marked by prominent purple lines. The cephalic vein was very much inflamed, and at about two inches from the cut extremity contained a small quantity of pus; the axillary vein was inflamed, but contained no pus. The periosteum was detached, and at numerous points small quantities of pus were found between it and the bone, rendering it easy to strip it off up to the tuberosity. The medulla protruded nearly an inch from the end of the bone, while the medullary canal contained a large quantity of sanio-purulent matter. The synovial cavity of the shoulder-joint was filled with pus, and the *right* lung infiltrated with the same, though no abscesses were formed; the *left* pleural cavity contained about 1½ pints of sero-purulent matter, while the lung on this side was comparatively healthy. The pelvis of the right kidney contained pus and oil-globules; left kidney pale and flabby. The liver was very much enlarged and softened; the spleen softened, but not otherwise changed.

*Great Sciatic Nerve hanging from the stump of a child, the limb having been torn off by the revolution of a carriage wheel.*—Dr. JOHN ASHHURST, JR., exhibited a specimen, and read the following history:—

E. R., aged nine years, about 4½ P. M., on the afternoon of May 20, 1863, was playing in the main street of Germantown, and catching upon the rear of a passing carriage his right leg became engaged between the spokes of the wheel, and his limb was torn off by the strain thus brought to bear upon its structure. The accident occurred a short distance above the Military Hospital, and as I was almost immediately summoned to the scene, it could have been but a very short time after the event that my personal observation of the case began.

The child had fainted, when I saw him, from the commingled effects of shock and hemorrhage; the latter had probably at first been very profuse, as the clothes of the patient were saturated with blood, but at this time had entirely ceased. As a measure of precaution, however, a Spanish windlass was extemporized from my pocket-handkerchief, which was afterwards replaced by an ordinary tourniquet. The thigh was entirely severed; the bone being broken off about the middle third, while the muscles were torn from their sheaths, and the skin cut as if with a knife about three inches higher up. The great sciatic nerve was found hanging about fifteen inches from the wound, having given way below its division in the popliteal space. The vessels were retracted, so as to be entirely out of sight; with the exception of a little blood which drained from the muscles below the point of application of the tourniquet, not a drachm of blood was lost from the moment I first saw the case. For a short time, under the free use of stimulus, the pulse improved and the patient rallied, becoming warmer and regaining entire consciousness. Secondary shock, however, came on before long, and from that time the failure of vital power, though slow and with occasional fluctuations, was in the main steady; and life became finally extinct about 5 A. M. of the 21st, rather more than twelve hours after the receipt of the injury.

One of the most interesting features in this case was the rapid cooling of the body after the accident, and the prolongation of this coolness, with very slight variation, for twelve hours, up to the time of death. In Dr. Richardson's very interesting paper "On Cooling of the Body after Death," in the January number of the *Medical Critic and Psychological Journal*, it is observed that in deaths from loss of blood, profuse exudation as in cholera, or obstructed circulation as in cases of embolus in large vessels, the body will cool to the temperature of the surrounding medium in two hours after death, and may do so before life is extinct. The presence of this boy's mother and friends prevented me from ascertaining the temperature of the skin by a thermometer, or I have no doubt I could have verified these results.

An interesting question is also suggested by this case, theoretical in the particular instance (for it was evident that death would ensue under any circumstances), but which in similar cases might be not only practical but of vital importance, viz., whether it would be better to resort to amputation at once, without waiting for perfect reaction, or to postpone operative interference until reaction, if it occurs at all, is established. That the statistics of the latter course should be more favourable, is only what we should expect; for the cases would by the act of waiting be selected. But I have sometimes doubted whether by delaying, surgeons did not consult rather their own reputation as successful operators, than the simple good of

the patient. A large and terribly lacerated and contused wound, with great nerves and bloodvessels implicated, is, I suspect, often a more seriously depressing agent than would be a rapid and skilfully performed amputation with or without the induction of anæsthesia.

Another point of some interest in a physiological point of view is, that although pain was experienced on the flap of skin and fascia being touched, there was no particular suffering felt when the sciatic nerve was handled

*June 24. Pericarditis with Effusion, completely adherent Pleura.*—Dr. JOHN ASHHURST, Jr., read the following account of the case:—

Samuel P., a sailor, aged 34, was admitted to the Pennsylvania Hospital, in April, 1862, suffering from great dyspnœa, which was supposed to be due to diffuse tuberculosis, from the general appearance, and especially the cyanosed complexion of the patient, although the physical signs of phthisis were more observed. There was evidently effusion on the left side, as shown by dulness on percussion, absence of the respiratory murmur, and of vocal fremitus and resonance. The sounds of the heart were very feeble, but no abnormal bruits were heard.

Under an alterative and diuretic treatment the patient slightly improved, but after a time, although the lung sounds had to some extent cleared up, he began to sink, and died on the 11th of July, 1862.

For some time before death the lower extremities had become œdematous.

An autopsy was made eight and a half hours after death, with the following results:—

*Thorax.*—On the right side the lung was healthy, and with no pleuritic adhesions. The left lung was completely adherent to the parietes, the pleural cavity being obliterated and the lung itself compressed and completely carnified by the pressure of the distended pericardium.

The pericardial sac was very much enlarged, and contained about twelve fluidounces of liquid. The pericardium adhered to the lung. Both surfaces of the sac were roughened with old effusions of lymph which gave the heart the appearance sometimes spoken of as the "beef's tongue" heart.

The heart itself appeared healthy, no valvular disease being observed.

*Abdomen.*—The peritoneal cavity contained about a quart of liquid; the left kidney was slightly pale; all the other organs appeared healthy.

No tubercle was detected in any part.

This case had been frequently and carefully examined by several accurate diagnosticians, but so far as I know the condition of the pericardium was not even suspected.

I may mention in connection with this case, one which occurred in the autumn of 1862, in the Military Hospital at Chester, Pa., in the ward of one of my colleagues. This was treated and considered as a case of typhoid fever, with hypostatic pneumonia; after death it was found to have been acute tuberculosis of both lungs.

# REVIEWS.

ART. XII.—*A Treatise on Hygiene, with Special Reference to the Military Service.* By WILLIAM A. HAMMOND, M. D., Surgeon-General U. S. Army; Member of the American Philosophical Society; Honorary Corresponding Member of the British Medical Association, &c. &c. Philadelphia: J. B. Lippincott & Co., 1863. 8vo. pp. 504.

ALMOST a century ago, the President of the Royal Society, Sir John Pringle, presented to Captain Cook a medal, with a public address, in honour of his account of the method by which he had preserved the health of his ship's crew, in a voyage around the world. And, still earlier, 1757, Dr. Lind published a work "On the most effectual means of preserving the health of seamen in the Royal Navy," in which he discussed with judgment the topics of foul air, diet, scurvy, ventilation, exercise, cleanliness, &c. Yet, notwithstanding the appreciation thus shown of many primary facts of sanitary science, concerning the army and navy as well as the public at large, it was reserved for the occurrences of a late European war, now familiar to all, to *prove* that bad hygiene is as fatal to an army as bad strategy; just as, in civil life, great epidemics have been required to compel apprehension of the value of local cleanliness, before appreciated only in theory. The present American war has extended a similar lesson; without the same, or nearly the same painful disasters to render it impressive; but rather, in most instances—thanks to the Sanitary Commission and the Medical Department of the Army—illustrating the soundness of the principles of preventive hygiene, by their successful application. If anything could be named as in any degree compensating for the evils of an immense war, such practical advancement in a science directly bearing upon the highest material interests of mankind, might be so considered. No one has had a better opportunity of observing, and no one could have more zealously devoted himself to applying all that can be known at the present time of military hygiene, than Surgeon-General Hammond; and few have been so well prepared for such duty by previous scientific training. It is not therefore from undervaluation of what he has contributed in the work before us upon the general subject of hygiene, that we are impelled to venture the opinion, that it might have been still more creditable, if not more useful to the profession and the public, if he had made it a treatise expressly and exclusively upon military hygiene; reserving for another volume the consideration of the general principles of the science of health. His reason for not doing so, however, is given in a very elegantly written preface; being a conviction that an imperative necessity existed for a treatise upon the principal subjects of hygiene. We may quote some of his words upon this point; especially as they indicate, in a certain sense, his *platform* as a thinker and author:—

"The most intelligent members of the medical profession recognize the principle that their efforts should be directed more especially to the prevention of disease than to its cure; and the people, who are rarely slow to comprehend matters which it is to their advantage to know, are beginning to appreciate the same fact.

"But while I do not wish to be understood as at all doubting the efficacy of proper medication in the treatment of disease, I am sure that the curative influences of hygienic measures have been too much neglected, and that drugs, the traditional actions of which have been positively disproved by physiological and chemical researches, as well as by the soundest deductions from pathology, are too frequently administered through a strict adherence to the routine which hinders the development of medical science, and cramps the powers of those who labour for its advancement."

While these sentences announce their author in the character rather of sanitarian than of physician, it is at the same time graceful for him to recognize, as he does, the intelligence, and to respect the practical experience, of the medical profession. Nothing less, in fact, would have been becoming to one who represents that profession in a high and important public office. It may be added, that the instances in which scientific research has, by cogent evidence, brought into question the "traditional actions" of officinal drugs, are exceptional; and, bearing in mind on the one hand the judgment of Lehmann, that physiological chemistry has not yet reached such a status as to enable it to afford *guidance* to therapeutics, we must, on the other, and for the same reasons, doubt its authority for *elimination;* and must hold that clinical medicine is, as well as physiological and chemical science, entitled to its own evidence and its own jurisdiction.

Surgeon-General Hammond's introduction conveys, in strong language and with striking illustrations, an idea of the immense advantage already realized by the application of hygienic principles to the care of armies. Sir John Hall, inspector-general of hospitals, stated before the British commission of inquiry, that, at the beginning of the Crimean war, he made, on one occasion, a requisition for a building, used as a stable for mules, to be turned over to him as a hospital for sick and wounded soldiers. After considerable correspondence and delay, "the mules carried the day!" A table quoted by Dr. Hammond from the returns of the director-general shows how great an improvement soon followed upon sanitary reform, which was extended throughout the British army. Thus, from 1830 to 1836, the annual deaths per 1000 men among all the troops, were 14; from 1859 to 1860, 5. At Gibraltar, from 1837 to 1856, 22; 1859 to 1861, 9. In Jamaica, the corresponding figures were, 128 and 17. Allusion is also made to the success of preventive measures on notable occasions during the rebellion in this country; the most remarkable of which was that of General Butler's administration at New Orleans; in which a summer passed without a single case of yellow fever, although the city was occupied by large numbers of Northern troops.

Dr. Hammond's work is divided into three sections: Section I. is on the Examination of Recruits. Section II. of the Agents Inherent in the Organism which affect the Hygienic Condition of Man. Section III. of Agents External to the Organism which act upon the Health of Man.

The first section opens with a statement of the indispensable importance of careful selection of recruits for the army, and of the frequent injury done in the army of the United States by its neglect. Thousands of totally unfit men, at the beginning of the war, were enlisted, to fill the hospitals or soon to be discharged. In one hospital of a hundred beds, Dr. Hammond discovered, at one time, fifty-two cases of hernia alone. In several regiments, the farce of inspection was performed by the surgeon walking down the line and looking at the men as they stood in the ranks. It is added, however, that "matters are better arranged now than at the commencement of the rebellion."

The limits of age for recruits, according to the United States army regulations, are eighteen and thirty-five years. In France and Prussia, twenty is the minimum; in Austria, nineteen; in Great Britain, with certain exceptions, eighteen. Napoleon's *dictum* upon the uselessness of boys in an army is sustained by our author, as it is also by Lévy, Ballingall, Kirckhoff, Coche, and others, and by the statistics of Quetelet. Dr. Hammond considers eighteen too low a minimum; adopting the view of Liharzik, of Vienna, that the human body does not complete its growth before the end of the twenty-fifth year.

"Physiologically, there can be no doubt upon the subject. The youth of eighteen years is immature; his bones are slender and deficient in the necessary amount of earthy matter to give them the proper hardness; the epiphyses are not yet incorporated with the shafts of the long bones, and, in the ribs, are still cartilaginous; the joints are undeveloped, not having yet expanded sufficiently to give firmness and strength to the limbs; the muscles are soft, and have by no means acquired their full power, as is shown by the investigations of Quetelet and others; the chest has not attained its full capacity, and the contained organs have not yet reached the maximum point of efficiency. In the digestive organs we find ample evidence of deficient power; substances which a mature man will digest with ease, cause cholera morbus, diarrhœa, or dysentery in the recruit whose organization is not perfected."

Dr. Hammond would place the minimum at twenty, or even twenty-two years. The maximum, thirty-five years, he considers sufficiently high. In stature, American soldiers are above those of Europe. In France the standard is less than 5 feet 1½ inch. In Austria, 5 feet. In the United States, 5 feet 3 inches. In Great Britain only is it higher, 5 feet 5 inches. Our author would allow the minimum to be as low even as 5 feet; below that, the development of chest and muscles is apt to be too slight for army life. Of eighteen hundred men, enlisted from eighteen States, U. S., one hundred from each State, two hundred and forty-one were six feet and over in height; while in the British army out of one thousand there were but sixty-five of six feet and over, and in the French army but four. Very tall men are objected to by Dr. Hammond, unless they have, as is not usually the case, a development of the chest and muscular system proportionate to their height. They are commonly wanting in robustness and respiratory capacity, and are more subject to hernia than others, besides being better marks for the enemy. The maximum proposed is six feet three inches. As Dr. Aitken has shown, however (quoted by Dr. Hammond), height must always be considered with reference to age. At eighteen, the height should be as near as possible to five feet four inches.

No point of physical conformation is held to be of more importance than capacity of chest. Dr. Hammond is of the opinion that no recruit should be accepted in whom the circumference of the chest immediately over the nipples measures less than half his height. Formulæ and tables are also cited from Hutchinson and Brent, in regard to the proportion of the circumference of the chest to height and weight. Brent found that the circumference of the throax, over the nipples, is twice the breadth of the shoulders. Four times the distance between the nipples is equal to the circumference; and the distance between the nipples is, in a normal chest, equal to the antero-posterior diameter. Dr. Hammond has taken pains to examine into the accuracy of these measurements, and confirms them. Symmetry of the chest is also important. Very young soldiers often have the chest flattened by constant stooping during the march, to afford purchase for the knapsack and other articles of equipment. For exact measurement of shape as well as size and extent of movement, several instruments are described. The

hæmadynamometer is recommended as especially convenient for estimating inspiratory and expiratory power. It may be remarked, by the way, that, as Dr. Hammond's book is not exclusively intended for medical readers, it might have been well to explain, as he does not, that this instrument and the cardiometer were originally designed for other uses. A description, too, with the engraving, of Scott's stetho-goniometer (p. 40) would have made it more available.

Dr. Hammond believes himself to have been, so far, alone in this country in the employment of the hæmadynamometer for any purpose. He states that the height to which a healthy man, five feet eight inches high, can raise the column of mercury, is, by expiration, about three inches; by inspiration, about two inches. The inspiratory power is, however, the most regular and suitable for comparison. With Hutchinson, Dr. Hammond found it to decrease, from five feet eight inches, both with increase and decrease of stature.

Weight is considered, properly, only in connection with age. Quetelet states that a man does not attain his maximum weight till he is about forty years of age; a woman, not till about fifty; both lose, normally, after those periods. A man at twenty should not weigh less than one hundred and twenty-five pounds. From eighteen to thirty-five the weight gradually increases; and it gains as the *height* progresses, at the rate of at least five pounds for each inch above five feet five inches.

Chapter II., upon the Special Qualifications and Disqualifications of Recruits, is brief but clear, adopting and following, to a certain extent, the views of Boudin.

The second Section commences with an interesting chapter upon the Hygienic Relations of Race. Dr. Hammond declares his belief in the diversity of origin of the several races of men, and adopts the theory of Agassiz, to our view, one of the least tenable of the many hypotheses suggested in opposition to the theory of Linnæus, Cuvier, and Humboldt. The present aspect of biological science appears to us especially unfavourable to Agassiz's theory; since the investigations of E. Forbes and C. Darwin, even to the minds of those who do not accept all the conclusions of the latter, have seemed to turn over a new leaf in this department of zoological derivation and distribution. We incline to go farther, and to designate the speculations of the diversitarian ethnologists as an almost closed chapter. This subject, although not immediately hygienic, is yet directly related to hygiene, in connection especially with acclimatization. Our author has done well, therefore, in introducing it into his book; and we may be allowed a few words of discussion upon it here. The terms in which the doctrine is stated (pp. 64, 65) place it in obvious contradiction to some familiar facts, a contradiction which it requires the boldest hypothetical reasoning to surmount. According to the theory in question, the earth's surface affords a number of centres of creation, floral, faunal, and human; each race of men, as of animals, is "peculiar to the region in which it dwells;" and there are of such human races sixteen in all. Let us select, then, two continents, the most important in modern history. In our author's language, they are designated thus as realms: "The *European*, inhabited by *white men;* the *American*, inhabited by *American Indians.*" Now, was Europe the "centre of creation" of its present white inhabitants? What says philology? What, history? If room exist for doubt there, let us revert to our own continent. In what sense can America, at this moment, be said to be "inhabited" by Indians, who form of its population the least important part? If migration be admitted, as it must be, as a characteristic of the predomi-

nant races, then, as a *fact*, the adaptative distribution of man into realms cannot stand. As an hypothesis in regard to remote time, whose proof, historically, is archaic and therefore unattainable, it could only claim probability, by analogy, if the general theory of Agassiz in regard to zoological distribution were established, which it is not, and does not now seem likely to be.[1] If we examine the views of Dr. Hammond in regard to the characteristics of distinct races, we find, in a later chapter (on Acclimation, pp. 294, 295), that he regards the colour of the skin and the character of the hair as *non-essential:* a very important but well sustained admission. What, then, are *typical* peculiarities? Of the most strongly marked race, the negro, they are said to be (p. 294), "the lengthening of the arms, the flattening of the calcaneo-tarsal arch, the backward prolongation of the os calcis, the curvature of the tibia, &c." These are definitely called "typical characteristics of the races in which they are found;" and so are "the form of the cranium, the shape and size of the features, and the mental organization." As to the bones of the extremities, they are so obviously under the influence of the development and action of the muscles, and the muscular system is so especially subject to variation under difference of use, that what might be called *race-habits*, acting through long periods of time, may account for all such modifications more readily than climatic conditions do for changes of colour and hair.

The long expanded chests of some inhabitants of high mountains or table-lands are at least equally remarkable; and more so are the facts that, in the hog, the number of caudal, sacral, lumbar, and dorsal vertebræ vary,[2] and that the wild hog has twice the number of incisors of the tame, while Filippi reports[3] the existence of a race of cattle in Piacentino which have fourteen pairs of ribs instead of thirteen. As to length of arm, Jarrold has shown that the forearm of the Scot is the medium between that of the negro and the Englishman.[4] Blumenbach found a native of one of the Marquesas Islands to agree exactly in his proportions with the Apollo Belvidere; and Owen tells us that one of the most perfectly formed skeletons he ever saw was that of an Australian!

Retzius and others have made the most of cranial differences. Yet, while Morton, the great authority upon "Crania Americana," asserted all American Indians to be of one stock, Retzius declares that "there is scarcely any part of the world where such contrasts are to be found between dolichocephali and brachycephali as in America." Weber, Wilson, Huxley, and J. A. Meigs all agree that "no cranial form is typical,"—"cranial measurements alone afford no safe indication of race."

Dr. Hammond asserts the very great improvement of nations by inter-

[1] As an exemplification of the difficulties in the way of this theory of Agassiz, we quote the following from Darwin: "Dr. Hooker has shown that between forty and fifty of the flowering plants of Tierra Del Fuego are common to Europe. On the highest mountains of Brazil, European genera were found by Gardner which do not exist in the wide intervening hot countries. At the Cape of Good Hope a very few European species were found, believed not to have been introduced by man, and not discovered in the intertropical parts of Africa. A list of the genera collected on the loftier peaks of Java raises a picture of a collection made on a hill in Europe! Dana remarks, that 'it is certainly a wonderful fact that New Zealand should have a closer resemblance in its crustacea to Great Britain, its antipode, than to any other part of the world.' Dr. Hooker informs us that twenty-five species of algæ are common to New Zealand and to Europe, but have not been found in the intermediate tropical seas."—*Origin of Species*, Am. ed., p. 326.

[2] Brace, Races of the Old World, p. 455.

[3] Quatrefages, Unité de l'Espèce Humaine. Paris, 1861.

[4] Brace, op. citat., p. 467.

mixture of blood with others of the same race; but denies the possibility of such improvement between different races. Passing over the abstruse ethnological question of the identity or diversity of the Huns with the earlier European nationalities, to which our author alludes, materials are at hand for controversy, if space allowed it, in regard to the degeneracy of half-breeds, and the sterility of mulattoes. His assertion upon this last point, although frequently made, is not sustained by intelligent medical men with whom we have conversed, who have spent most of their lives in the South; more than this, statistics disprove it. Brace[1] cites a table, given by M. de la Sagra, of the white and mulatto population of Cuba, from 1774 to 1841, showing that, in sixty-seven years, the mulattoes, male and female, increased in number more rapidly than the whites. Humboldt found that in Mexico the mulattoes were longer lived than the native Indians or Europeans. The Pitcairn Islanders demonstrated that the Teutonic and Polynesian races can unite without loss of fertility. The Canadian half-breeds are described by Prof. Wilson[2] as a race superior either to the pure Indians or the French of Lower Canada. This excellent authority alleges that "the intermixture of red and white blood does not lead to degeneracy, sterility, or extinction, but has created an extensive population of half-bloods." Other examples might be found, in the works of Prichard and others, to the same effect.

Apart from this question, however, Dr. Hammond gives some interesting and valuable information in regard to the marked characters of the three races which together inhabit this continent—the European, the Indian, and the Negro. The European has the greatest amount of physical as well as intellectual force, the greatest capability of resisting morbific agencies, and the highest capacity of adaptation to new climates. The American Indian is more prone to affections of the respiratory organs than the white man in the same regions. Cholera and variola are especially fatal to him; delirium tremens is said never to occur in this race, and idiocy and insanity less frequently than among Europeans. The negro, in this country, has never yet had an opportunity of normal development; the proper experiment of his civilization must be, as Dr. Hammond remarks, carried out on the continent of Africa. Negroes in temperate climates are extremely liable to phthisis and other scrofulous affections. At Gibraltar, in the British army, 43 blacks in 1000 died annually from consumption, against 5.3 whites; at Sierra Leone the proportion was about the same of both. The immunity of negroes against malarial diseases is proverbial. It is asserted by our author, and confirmed by Livingstone, that they recover much more readily than whites from syphilis. They are more subject to tetanus, but less so to other nervous diseases than Europeans. Surgeon-General Hammond's opinion that they could be made available in army service only as cooks, nurses, and teamsters, received modification under the influence of recent events, as his work was going through the press: it being said in his preface that it is "no longer a subject of doubt that they are adaptable for all the purposes of war."

Alluding to Boudin's statement of numerous accounts of travellers of the Aïssaoua of northern Africa being insusceptible of poisoning by the bites of venomous serpents, our author gives it as the result of his own observations, that the North American Indians can receive the venom of the rattlesnake into their blood "without being subject to the morbid phenomena to which the whites are liable from a like injury."

[1] Races of the Old World, etc., p. 483.
[2] Pre-Historic Man, vol. ii. pp. 348, 390.

Chapters II. and III. of the same section treat of Temperaments. Dr. Hammond admits four: the sanguineous, lymphatic or phlegmatic, choleric, and nervous. There is no doubt of the propriety of such a classification, except that no term yet devised for the third of this series appears appropriate. The essential characteristics of what is commonly called the bilious or choleric temperament appear to be, firmness of organization with moderate activity and great endurance; the external signs of which are, dark complexion and hair, rather hard skin, firm flesh, without adiposity, pulse strong, form square. We cannot ascertain the evidence upon which these traits are associated with hepatic susceptibility or peculiarity of any kind. Rather too much appears to us, also, to be asserted upon the influence of temperament on mental and moral character; as thus, of the sanguine temperament :—

"Inconstancy is the predominating influence. Good resolutions are formed but to be broken; friendships are contracted to be soon abandoned for others, which in their turn are soon given up. In love, the individual of sanguine temperament is fickle and faithless, and cares less for his honour than his pleasure."

Although Marc Antony, *perhaps* Plato, Charles II., of England, Lorenzo di Medici, Murat, Mad Anthony Wayne, and Shakspeare's Mercutio (the examples given by our author) may meet the mental as well as material requirements of this portrait, all of us must know examples to the contrary, in private as well as in public life. We should be sorry to distrust all our friends who have a florid complexion, red hair, blue eyes, small hands and feet, and good digestion. No doubt, however, it is but a general *proclivity of organization* that the author means to assert; in which case, the graphic energy of his language must be our excuse for hypercriticism. Of the choleric temperament, his illustrations are, Alexander, Julius Cæsar, Brutus, Mahomet, Charles XII., the Czar Peter, Cromwell, Sixtus V., Cardinal Richelieu. Of the nervous, Voltaire, Frederick the Great, and John Randolph. The recollection of many professional men in this country, will supply, as a signal example, the late Doctor George B. McClellan.

Idiosyncrasy is next briefly considered, in a chapter of three pages. The influence of age and its tendencies then receives attention. Dr. Hammond divides human life into three periods—that of increase, that of maturity, and that of decay. The physiological characters and special proclivities of each are treated of. Our attention is arrested by some remarks of a somewhat speculative character upon the duration of life.

"If it were possible so to adjust the repair to the waste that neither would be in excess, there is no physiological reason why life, if protected against accident, should not continue indefinitely. But this is not, with our present knowledge, possible, and consequently decomposition eventually becomes predominant, and death from old age results." (p. 93.)

"If we had a perfect knowledge of the laws of health, there would be no physiological reason why decay and death should take place except through accidental causes." (p. 106.)

"Through the neglect, then, of laws which we do understand, and from our ignorance of others which certainly exist, death, if not hastened by accident or disease, takes place surely by old age." (p. 107.)

Few hygieists or physiologists can, we fear, have so large a faith in the future possibilities of sanitary progress. Rather may we content ourselves with accepting the conclusion of Carpenter (also quoted by our author) that "the limitation of man's development, and the definite period of his duration, are ultimate facts; no event that we can discover intervenes be-

tween their production and the will of the Deity." Nor, we may add, will any precaution that we can devise be likely to intervene between the same will and the universal fulfilment of the law of mutation and mortality of all organized material forms.

In the interesting chapter upon Sex we notice a partial assent of the author to the opinion of Gall and Lévy, that there occurs in men a periodical manifestation analogous to the monthly period of females; affecting the secretions generally, and the nervous system.

Chapter VII., On Hereditary Tendency, is brief. Reference is made to the work of Dr. P. Lucas, as the best upon this subject. The influence upon the health of offspring of the consanguinity of parents is not mentioned.

Habit, generally considered, and Morbid Habits, occupy two chapters. Well expressed and interesting as these are, they do not seem to us to cover all the ground required in a general treatise on Hygiene, upon such topics. For example, to one whose reading upon the science of health might be restricted to this volume, it would be scarcely satisfactory to find, upon the subject of diarrhœa, three paragraphs, confined entirely to the statement of the frequent innocuousness of that disorder, with illustrations of the sometimes fatal result of arresting it. Of two paragraphs upon Constipation, the longer is devoted to instances of extraordinary periods of inaction of the bowels. Upon the subject of the generative organs, a more extended and very judicious discussion occurs, especially with reference to the military life. The comparative slighting of some subjects, above asserted, is to be very properly explained by the particular direction of the whole book, toward the purposes of military hygiene; but we find, in what appears to us a deficiency upon certain points, excuse at least, if not justification, for the opinion ventured at the beginning of this review, that the devotion of all his attention, in this volume, to army hygiene, might have made a work, on the whole, still more capable of advancing the distinguished reputation of its author.

Many readers will, however, we admit, hesitate to assent to this opinion, after perusal of the twenty-nine chapters of Sec. III. Three of these are engaged with the atmosphere; its normal composition, accidental or non-essential constituents, and physical properties. Besides a very well prepared account, showing wide research, of all the principal facts stated by other authors, Dr. Hammond gives the description and results of a number of original experiments and observations of his own in regard to the atmosphere and its relations to life. Thus (p. 153) he improved upon Bernard's experiment, following those of Regnault and Reiset, to test the influence upon vitality of a large amount of carbonic acid in the air, while no deficiency of oxygen exists. His result was confirmatory of the statement, that carbonic acid is free from direct or *positive* toxic effect upon animals.[1] He also repeated several times, with success, Herapath's experiments for the discovery of iodine in the atmosphere; as well as those of Dupuytren upon the poisonous action of sulphuretted hydrogen gas. In the latter case, more than $\frac{1}{1000}$th of the gas was found to be fatal in twenty or thirty minutes to sparrows and mice. In pure sulphuretted hydrogen, they died immediately, without convulsion; their blood after death being perfectly dissolved, the blood corpuscles completely broken down. Dr. Hammond's judgment is decidely expressed, that the "National Hotel Epidemic" at

[1] Dr. Herbert Barker, however, found prostration and diarrhœa to follow the inhalation of carbonic acid in small proportions. See Brit. and For. Med.-Chir. Review, Jan. 1859. Orfila and Seguin also report similar results.

Washington, D. C., which produced so much excitement some years ago, was due to emanations from a sewer, the chief agent in which was sulphuretted hydrogen. A stream of gas, strong enough to extinguish a lighted candle, was found flowing into the cellar of the house. The symptoms produced, also, were very similar to those observed by Dr. Taylor in the workmen of the Thames Tunnel.

Dr. Hammond proved by experiments upon rabbits that light carburetted hydrogen and olefiant gas, when pure, are not poisonous; the deleterious effect of the inhalation of illuminating gas being therefore due to the presence of carbonic oxide.

Ozone, also, has been with him a subject of careful observation and experiment. He found birds and mice to die in a few minutes, with symptoms of asphyxia, in an atmosphere containing not more than $\frac{1}{10000}$th of ozone. Small quantities of it invariably corrected the bad odour of putrescent vegetables and meat. At Fort Riley, Kansas, Dr. Hammond ascertained, by numerous observations, that a much greater proportion of ozone existed in a high locality, free from intermittent fever, than in one almost contiguous, bordering the river, in which the inhabitants were extremely subject to intermittents. On two occasions, during the prevalence of cholera at the same post, he found the air to give no indication of ozone.

The fallacies and difficulties connected with ozonometry are fully appreciated by our author. Nitric acid, and, according to Cloëz, certain vegetable oils and vapours are mentioned as giving similar results with ozonometric paper, prepared with iodide of potassium, starch and water. Moreover, as other writers have shown, the movement or stillness of the air makes a decided difference in the indications. Captain Humbert and Dr. Arthur Mitchell, in Algiers, with places of observation not far separated, but one eighty feet higher than the other, found great and frequent discrepancies between them.[1] Dr. Hammond does not allude to the test mentioned by Boudin,[2] consisting of a paper impregnated with sulphate or chloride (*chlorure*) of magnesia; the decomposition of the salt producing a brown tint, of various degrees of depth. Dr. Hammond is no doubt correct in his final conclusion, thus expressed (p. 166):—

"Some later writers deny that ozone is ever present in the atmosphere. We are not able to say positively that it is; we only know that there is an element in it which possesses the reaction of ozone. Till our ozonometrical processes are improved, it is not probable that we will arrive at any more definite information. There is every assurance that a vast field of inquiry exists in this direction, the investigation of which cannot fail to enlighten us relative to the causation of many diseases which now defy our utmost powers of research."

Organic matters in the atmosphere are next considered, in some very interesting remarks. Dr. Hammond frequently sought, in the atmosphere as well as in the discharges of cholera patients, for the so-called "cholera cell;" but never met with it. His observations enable him to correct the statement of Pouchet, that the ova of infusoria and the spores of fungi are never to be found in the atmosphere.

"While agreeing with him relative to the great predominance of starch granules, I am sure that I have discovered bodies which presented all the characteristics of ova of infusoria, and spores of cryptogamic plants. The instrument made use of in the examinations did not vary materially from that employed by Pouchet. It consisted of a glass tube, two inches in diameter, closed at each end by a well-fitting cork. One of these corks was perforated

[1] Brit. and Foreign Medico-Chirug. Rev., Jan. 1856.
[2] Traité de Géographie et de Statistique Médicales, &c., vol. i. p. 160.

so as to receive the pointed extremity of a small copper funnel, the other was connected with an aspirator. Into the large tube a square piece of glass was introduced, and placed at the distance of about the $\frac{1}{12}$th of an inch from the extremity of the copper funnel. When the aspirator was set in action by opening the stopcock, the air entered the funnel and impinged upon the glass plate, where it deposited its morphological constituents. After an hour or two the plate was removed, and submitted to microscopical examination. Frequently I obtained the spores of penicilium and of other mucedines, and occasionally dried infusoria of the more common varieties." (p. 174.)

On the very important subject of malaria, Dr. Hammond regards with considerable favour the "fungus theory" of the late Dr. J. K. Mitchell; having himself ascertained the occurrence of immense quantities of spores, especially the bassidiospores of hymenomycetous and gasteromycetous fungi, in the atmosphere of malarious localities. Besides the remarkable properties of the *amanita muscaria*, allusion is also made to Dr. B. W. Richardson's observations upon the narcotic and anæsthetic properties of *lycoperdon proteus*, or common puff-ball. Dr. Hammond has confirmed the statements of the latter, by experiments upon animals as well as upon himself. Still, these effects do not constitute specific fever. More immediately to the purpose are the singular experiences of Dr. Salisbury, of Ohio, quoted from this Journal,[1] in regard to the apparent production of measles by contact or inoculation with fungous growths attaching themselves to damp and mouldy wheat straw. One of the most remarkable examples of disease produced by a fungous vegetation is that called *mycetoma* by its describer, Dr. Carter, of Bombay; in which the plant acts as a parasite, causing swelling and abscess, followed by sinuses, only curable by amputation.[2] Here, again, however, we have nothing like the effects of local miasmata.

After a clear and concise statement of the best established "laws and habits which influence malaria," Dr. Hammond gives a very favourable opinion of the preventive power of quinia and cinchonia against malarial disease. Two grains of the sulphate of quinia, or four of sulphate of cinchonia daily, are considered to be sufficient for those unavoidably exposed; although medical officers are enjoined always to urge the choice, for camps or barracks, etc., of healthy localities. The above doses of the preventive appear to us rather small. Although DuChaillu ascribed his immunity in Africa to a single grain of quinine daily, yet Livingstone was disappointed, in other parts of the same continent, with the constant use of thrice as much. The building of fires throughout a camp, when necessarily placed in a miasmatic region, is strongly recommended by Dr. Hammond.

Restricting the word malaria, apparently, to its original Italian sense, our author does not enter upon the subject of the causation or prevention of yellow fever or other endemics or epidemics. In the short chapter upon the physical properties of the atmosphere, it is stated, in regard to cholera, that a very considerable rise in the barometer occurred, while this disease was prevailing, at the several posts and garrisons of the United States Army, in 1849.

Temperature, Light and Electricity, in their hygienic relations, have each a chapter. The important fact is mentioned, that according to a table prepared at the Surgeon-General's office by Assistant-Surgeon J. J. Woodward, U.S.A., the sickness and mortality of the United States forces have, since the commencement of the rebellion, been much less during the winter

[1] July, 1862. [2] Brit. and For. Medico-Chirurg. Rev., July, 1863.

months than during the summer. This is true at least as far as the estimate was made, of all the diseases of five armies, comprising about three hundred thousand troops. These results are, as Dr. Hammond remarks, different from those obtained in European countries.

A good and full chapter follows upon Water. We can find no fault with any part of it, unless it be with the recommendation to drink several tumblerfuls of water at every meal (p. 224). Somewhat startling this advice may seem to a dietarian in Europe; where, from the light wines of the Romanic races, through the beers of the Teutonic, up to the strong spirits of the Northern Celt, all conspire, we will not say by instinct, but by habit, to avoid pure water at the table. No doubt this country may have the advantage, as a matter of hygiene, over the rest of the civilized world, in the predominantly aqueous nature of its regimen; but even this may be carried too far. Dr. Hammond sustains the above recommendation, however, by actual experiment.

> "I fed a dog moderately, and then administered to it a pint of water; fifteen minutes afterward the animal was killed by division of the medulla. On opening the stomach, having previously tied it at its cardiac and pyloric openings, nearly all the water was found to have been absorbed. The food was as far advanced in the process of digestion as it should have been for the period during which it had been in the stomach. There was the ordinary quantity of gastric juice present."

Exaggeration is considered by Dr. Hammond to exist in popular works in regard to microscopic infusorial or algoid organisms in drinking water. It is only such water as is overstocked with them or contains zygnemaceæ, diatomaceæ, or the spores of fungi, that is objectionable. A green scum of confervoid growths does not indicate impurity of the water. Organic matter in solution, as our author states, may be readily detected and estimated by the permanganate of potassa, or Condy's solution of permanganates. A drop of saturated solution of the permanganate of potassa added to a half pint of distilled water, gives to it a beautiful and permanent pink colour; but the presence of organic matter causes the destruction or *prevention* of this colour. Of a standard solution, Dr. Hammond found that it required four drops to give a fixed colour to ten ounces of the water introduced into the city of Washington; eighteen to produce the same result with water collected from a marsh near the city, and twenty-seven in the water of a canal which flows through the town.

Upon the subject of Bathing, mention is made of the observations of Beneke and Lévy upon the effects of sea-bathing. It should be remembered that some doubt has been thrown over the results of the former, as well as over those of some other investigations into the changes of tissue-metamorphosis, by the searching analyses of Radiche, of Bonn.[1] In regard to urine, for example, both he and Vierordt have found that a certain wave-like increase and decrease occurs, which might induce a difference of results according to the day chosen for experiment. Dr. Hammond omits remarking upon the length of *time* suitable for immersion in the cold bath; a very important point; since a rapid plunge may produce reaction in many to whom a prolonged immersion would be injurious or dangerous. The effects of the tepid as distinguished from the warm bath are also overlooked. An ingenious and excellent contrivance of M. Dunal, of Marseilles, for giving the shower-bath to soldiers, three or four at a time, so that three hundred and fifty could pass through it in four hours, is described (p. 239).

[1] Archiv. für Phys. Heilk. 1858, p. 145.

Filtration is very carefully and well discussed; the preference being given to charcoal filters, or those of porous bisque. For distillation, Dr. Normandy's apparatus, which aerates as well as purifies the water, is particularly recommended.

A short chapter is given to the topic of Soil. It contains, besides Schübler's tables of the relative capacity of different soils to absorb and give out heat and moisture, some experiments made by the author upon the comparative power of sand, clay, and humus to absorb matters exhaled from organic decomposition. This is a very important inquiry, as aiding in the choice of localities for camps or barracks. Humus stood highest, in its facility of absorption and subsequent emanation of the volatile results of putrefaction and decay; and pure sand lowest, clay, and a mixture of sand, clay, and marl, being intermediate. In the next succeeding chapter, upon Locality, we meet with the incidental expression of Dr. Hammond's opinion, based in part upon *post-mortem* examinations, that the "mountain fever" of the hunters of the Rocky Mountains is scarcely distinguishable from the ordinary typhoid fever of the country. On two occasions he discovered, after death, in such cases, "the usual diseased condition of Peyer's glands."

The large subjects of Climate and Acclimation are well considered in the 10th and 11th chapters of our author's 3d section. Would not *acclimatization* be a better word? The French *acclimatement* is euphonious enough, but the English word adopted by Dr. Hammond and others generally, and still more the verb "to acclimate" sound un-English to our ears. The belief in the multiple origin of human races has not prevented Dr. Hammond from advancing very sound views in regard to the naturalization of man in new climates. He denies, not too emphatically, the current notion that the Caucasian or European stock degenerates in America. If we do grow somewhat Indian in the average of our American face and figure, yet it remains true that "as the result of over fifteen thousand observations, embracing the chief points desirable in a collection of vital statistics, I am enabled to assert that, so far as physical development is concerned, it is very doubtful if any people in the world excel those of the Northern States." Of the other apparent failures in the effort at transplantation, as of the English in the East and West Indies, and of various Europeans in the Arctic regions, the true explanation is asserted to consist in the attempt being made without the mode of life being adapted to the changed conditions under which the organism is placed. An eloquent passage is quoted from Lévy[1] to this affect. We meet in Boudin[2] a discussion of one of the most difficult problems of the kind, that of the future of the French in Algeria. His conclusions are not quite in harmony with those above stated, although he admits that they are not yet final. After quoting, amongst others, General Duvivier, who declares that "*les cimetières sont les seules colonies toujours croissantes de l'Algérie,*" and giving many statistics of mortality and disease, Boudin ends thus: "The acclimatization of the French in Algiers in the agricultural state is, so far, but a hypothesis; its possibility remains to be proven."

Dr. Hammond cites the instructive experience of Dr. I. I. Hayes upon the conditions necessary to the maintenance of health in arctic explorations. It was ascertained by this navigator that the highest inhabited latitudes afforded "a climate of remarkable healthfulness," exemption even from scurvy being secured by adopting the regimen of the Esquimaux, who live

[1] Traité de Hygiène.

[2] Traité de Géographie et de Statistique Médicales, etc., tome ii. p. 171.

almost exclusively upon fresh fat meat, abundantly consumed. This was also more nutritious and anti-scorbutic when eaten raw—congelation removing the repulsiveness of ordinary raw meat. Alcohol was considered by Dr. Kane and Dr. Hayes as useless and even injurious in very cold climates. Such is, indeed, the general testimony of arctic voyagers.

Much the most important portion of Dr. Hammond's book comes next before us; his eight chapters, comprising one hundred and fifty-six pages, upon Hospitals, Camps, and Barracks. It would seem to us a more natural arrangement to conclude first his discussion of what might be called the Principles of Hygiene (of which all that concerns food and clothing is left by him to the end of the volume), and then to take up their practical application to the economy of health in individuals and in armies. The substance, however, of these chapters is so interesting and so valuable that we need not pause to quarrel with their arrangement.

The literature of hospitals has not, so far, been extensive. Since the time of Pringle, Brocklesby, and Aiken, who agreed that hospitals were, as then conducted, a curse instead of a blessing, although John Howard, Sir Gilbert Blane, Iberti, and others, did their share towards inaugurating the needed reform, very few have given the subject the attention it deserves. No one has contributed more valuable practical matter in regard to it than Florence Nightingale;[1] and to her work, and the "Etude sur les Hôpitaux"[2] of M. Husson, the "Suggestions" of Roberton, and the Report of the Commission of Inquiry in Great Britain, all recent study upon the topics of hospital construction and management, so far as books are concerned, might till now have been confined. Surgeon-General Hammond has had the advantage of the largest possible experimental as well as theoretical examination of the whole subject. We may expect, therefore, to find in his book the latest and best ideas, the soundest principles of hospital construction and arrangement. Nor are we disappointed in this expectation.

The credit of taking the lead in the actual and essential improvement of the modern hospital system is, we believe, divided between Italy[3] and Belgium. There are some who still consider the Belgian hospitals (unless in regard to their latrines) the best in the world. In France a commission was appointed in 1786 to report a plan for the rebuilding of the Hôtel Dieu; but their recommendations, including the now approved pavilion system, were not acted upon until much later, when the Lariboisière was the result. In Germany the reform yet lags behind, and in Holland has scarcely begun. The Portuguese government has at least shown a liberal disposition in sending, not long since, a medical commissioner on a tour of inspection through Europe. In Great Britain many defective hospitals exist, both old and new; but in others the now established principles of hygiene are properly applied. A great stimulus to interest in the subject in this country has been afforded by the present war, although all the new military hospitals constructed so far have been "temporary," the longest time expected for their duration by Surgeon-General Hammond being ten years. The question will suggest itself at once: Is this wise? It would certainly have been thought otherwise in England or on the continent of

[1] Notes on Hospitals: being two Papers read before the National Association for the Promotion of Social Science, at Liverpool, October, 1858; with Evidence given to the Royal Commissioners on the State of the Army, in 1857. By Florence Nightingale. London, 1859. [2] Paris. 1862.

[3] The annual endowment of the hospitals of Rome is over $250,000; those in Florence and Milan, however, are in some respects superior. Italian hospitals are especially remarkable for the *height* of their wards. They have not, however, kept pace with the more recent improvements.

Europe. There the "permanent method" for all important institutions is believed to be most economical; and, in a parallel case, if such could there occur, at least two or three first-class permanent hospitals would have been erected, at selected centres, at very little more cost, and with, we believe, better economy in the end, than attends the vast but slight structures now used for the victims of our war. Of course a great number of additional strictly temporary hospitals would still have been needed, relying upon the temporary duration of the war itself. But the genius of our people aims at the doing and making of everything quickly as well as largely; progress and improvement are ever in view; and all things connected with this rebellion have been so unprecedented, so beyond expectation or calculation, so often experimental, that no individual or authority can be fairly criticized for limiting anticipation and provision to short periods.

We meet first, in the work before us, excellent remarks upon the general principles of hospital location and construction. As bad examples of locality, the hospital of the Guards' recruiting barrack, at Croydon, the U. S. hospital at Fort Meade, in Florida, and the Hôtel Dieu upon the Seine, in Paris, are mentioned. A gravelly soil and an elevated site are best. The hospital at Fort Mackinac, lately erected, is upon the solid rock. Of materials, stone is the best for permanent hospitals; for the temporary, wood, plastered inside and out. The best lining for walls is Parian cement, although it is expensive; hard-finished plaster, well painted and varnished, is the next in advantage to it. We find Florence Nightingale, however, positively condemning plaster as well as whitewashed brick walls; insisting that "pure, white, polished, non-absorbent cement is the only fit material."[1] This authority agrees with Surgeon-General Hammond in urging that the floors should be of oak, saturated with a mixture of beeswax, turpentine, and linseed oil. With this, the necessity of scouring the floors is done away with, and wet and dry rubbing will keep them pure and fresh. We believe that mischief is often done by too much wetting of ordinary hospital floors; having seen a general catarrh, or bronchitis, or worse affections, follow its periodical occurrence; and can well credit F. Nightingale's assertion, that "there cannot be a doubt that washing floors is one cause of erysipelas, &c., in some hospitals."

Dr. Hammond asserts that the temporary "are far healthier than permanent buildings; an assertion the truth of which has been thoroughly demonstrated during the present rebellion. For wounded men, tents, both in winter and summer, are the best of all hospitals." (p. 310.) We have no doubt of the accuracy of the comparison above cited, between the temporary and permanent hospitals in which the sick and wounded of our army have been treated during the rebellion. But what kind of permanent hospitals are they? Although some few of the best civil hospitals have made partial arrangements for military patients, the bulk of the army hospital service in permanent *buildings* has been, from the nature of the emergency, in edifices built for quite other purposes, mostly in or very near to large cities. We must, therefore, with due respect, hesitate to accept the verdict of preference for the temporary over the permanent hospital, "cæteris paribus," as absolute and final.

[1] Notes on Hospitals, p. 15. A wash of soluble glass, or a solution of silicate of potash, recently proposed as a water-proof paint for brick walls, would probably afford the most effectual and cheapest substitute for the Parian cement, whether applied to brick or plaster.

As general principles, for every hospital it is essential:—

"1st. That it is capable of being well ventilated.

2d. That it is sufficiently capacious for the number of inmates it is to contain.

3d. That it admits of good drainage.

4th. That it is provided with a sufficient number of windows.

5th. That the kitchen, laundry, and other offices of administration are well arranged and of ample size.

6th. That efficient water-closet, ablution, and bathing accommodations are provided.

7th. That it is amply supplied with water, and gas or other means of illumination.

8th. That the furniture, of all kinds, is of suitable quality.

9th. That the officers and attendants have their proper respective duties assigned to them, and that they are in number sufficient for the wants of the sick.

10th. That proper rules are established for the government of the hospital, for the diet of the inmates, and for preserving order and an efficient state of police." (p. 310.)

Of all possible plans for the construction of a hospital, that of the closed court or hollow square is evidently, as our author remarks, one of the worst, although one of the oldest. The Bicêtre, the Salpêtrière, the Saint Louis, and Maison Municipale de Santé, of Paris, Guy's Hospital, at London, and the Ospitale Maggiore di Milano are all upon this plan, as is also the newer military hospital at Algiers. Scarcely better than this is that in which the wards are crowded together in pairs or by fours, as in all the U. S. Marine Hospitals of the first class, and in the Hôpital de la Clinique of Paris, which was originally a monastery. The new Victoria hospital at Netley, constructed without advice of the medical department, although the most extensive military hospital in Great Britain, exhibits a very faulty design. The wards are small, having from nine to fourteen beds, and generally have but one face exposed to the external air. Crowding of wards, in double row, is also a very serious defect in the new hospital of King's College, London.

In the work before us, a most valuable feature is that all exposition of principles in regard to hospitals, and criticism of condemned as well as of approved examples, is made lucid and demonstrative by ample illustration, with the aid of ground-plans and elevations. Without these, it is impossible, in review, to do justice to this part of the book, which every one interested should study for himself as the best of manuals upon hospitals.

Further important rules laid down by Surg.-Gen. Hammond are, that the long axis of every hospital building should run north and south, so that both sides may have the sun on them a part of the day, and that the first floor should not be upon the ground nor over a cellar, but elevated by a basement, or by pillars, to a height of three or four feet above the surface. He objects, also, to a hospital ever consisting of more than two floors of wards, and considers one preferable—the difficulty of administration more than outweighing, in his view, any advantage belonging to two. This does not seem to have been the opinion of those who planned some of the best modern hospitals, as the Lariboisière and the military hospital at Vincennes, each of which consists of three-storied pavilions. It has been established, as Dr. Hammond admits, that the upper rooms in buildings are more healthy than the lower; but he insists that not more than one hundred sick should be kept under one roof, whether in one or several rooms.[1]

[1] At the Lariboisière, with three flats, each pavilion has but one hundred and two beds.

No doubt a third story ward, to be salubrious, requires as high a ceiling as lower ones, and still more free admission and exit of air, as organic exhalations ascend. But, with such conditions, we cannot realize the weight of the objection to an arrangement like that of the Episcopal Hospital at Philadelphia, which has, besides an elevated basement, in each pavilion, two floors of wards and a well-ventilated attic, the latter having a double roof and being not always used, but reserved for special cases. In our climate, in summer, the burning heat of the sun upon a roof is so intense, that the uppermost room might often with advantage be left empty, or used for storage. Although the system of ridge ventilation, preferred by Dr. Hammond, can only be applied to a single or upper story, yet, by having a double wall, the same principle, essentially, may be extended to a first floor, or second, by maintaining a free and permanent communication between the lower room (along the side walls under the ceiling), and the intramural passage leading to the ridge above.

The arrangement of a ward and its accessories is the hospital unit. A large hospital is, then, as Dr. Hammond remarks, a sort of polyp. A ward should be oblong, with only two rows of beds, a window to each two beds, and a width not greater than twenty-five feet, to prevent stagnation of the air in the centre of the room. The very lowest dimensions admitted by Dr. Hammond as allowable for permanent hospitals, are, for a ward of fifty beds, one hundred and seventy-five feet of length, twenty-five of width, and fourteen of height. This will give one thousand two hundred and five cubic feet to each patient. Florence Nightingale's *minimum* is one thousand five hundred cubic feet for each; and that appears to be the European theoretical standard. The same authority prefers thirty-two patients to any other number for a single ward, and calls for a territory of eight feet by twelve for each bed. In regard to height, Dr. Hammond directs "not less than fourteen feet; in permanent hospitals not over sixteen. Less than this renders the air close, while more is of little or no advantage." It is urged by some, that a "hospital atmosphere" is more apt to be formed in a ward of great than of medium height. We cannot believe this to depend on anything but the disposition of the windows, or other ventilating means; and this impression has not been formed without some opportunity of comparison. In the loftiest buildings in the world, such as the cathedrals of the Old World, there is the least possible feeling of closeness, although they are much shut up, and often have large numbers of human beings within them. A lofty ward, otherwise well proportioned, as at the Santo Spirito Hospital at Rome,[1] appears to us to afford, with high windows, admirable facility of ventilation. It is true, no doubt, that, as our author observes, it is by no means impossible to produce sickness in well persons by crowding them together in the open air. But this is only the case with very close crowding indeed; and, with difference of temperature within and without, if openings be allowed, currents of air are probably more *constantly* present within a well-ventilated, large room than out of doors, although with such slow movement as not often to be perceived. Florence Nightingale considers that "with from twenty to thirty-two sick, a height of fifteen to seventeen feet is enough, but it would not be enough for more."[2] "A ward of double the size may be rendered perfectly healthy by having a

[1] This hospital, notwithstanding an insalubrious situation, has, with nearly fifteen thousand annual admissions of all diseases, an annual mortality of little more than seven and three-quarters per cent.

[2] Notes on Hospitals, p. 57.

height in proportion to its width." Her objection to great height is, simply, its expense.[1] Our judgment goes decidedly with that of Dr. Ordronaux,[2] that "ceilings should be high; the higher the better." Of course, the windows should be high also, reaching to the ceiling. About one-half of the walls of a ward should, if possible, be glass; and the best windows are those which extend from floor to ceiling—the whole height of the walls.

The accessories which are indispensable to every ward are, a bath and ablution room, a water-closet, and a ward-master's room. A mess-room is often added for convalescents.

In the general plan of a hospital, as Dr. Hammond observes, reducing it to its simplest form, two factors are to be considered—the ward and its administration; the latter is constant, the other variable. There may be many wards with but one administration.

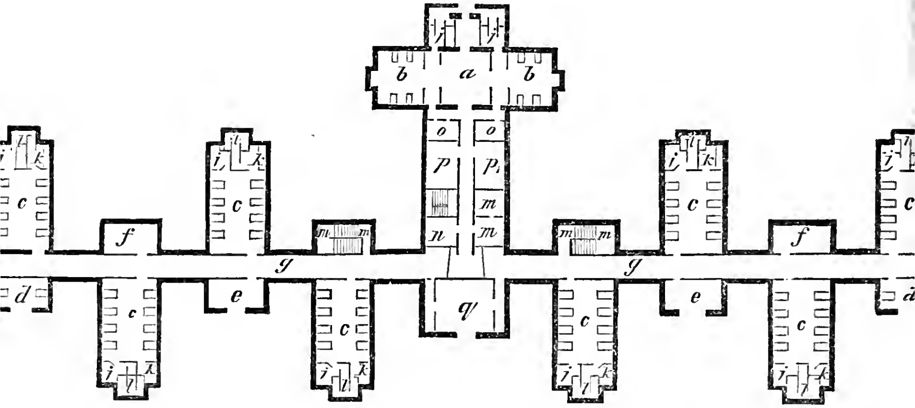
> "The principle, therefore, is, that the wards form a collection of hospital buildings which centre around a nucleus—the administrative department. No other arrangement than that which entirely separates the wards from each other is worthy of consideration, except to receive condemnation. Any other is altogether unfit to meet the necessities of the sick, and affords conclusive evidence that the designer is ignorant of the first requirements of sanitary science." (p. 331.)

So far does Dr. Hammond urge this principle of *ward separation,* that he criticizes, on a later page (p. 363), an arrangement by which, in certain hospitals, "the partitions separating the wards from the corridor do not extend to the peak of the roof; it is thus possible to throw a stone, for instance, from one ward into another, and thus all the advantages of the pavilion system are lost." If, however, the corridor be sufficiently wide, and the distance between the ward-pavilions twice, or more than twice their height, we must risk the above threatened condemnation so far as to confess our inability to see the advantage of *shutting off any part of the aerial circulation* through a hospital. Partitions seem to us merely necessary evils, hygienically considered, however unavoidable they may be for certain parts of the administration. The separation, to be perfect, should be aerial, that is by ventilating draughts through and upwards between the wards, rather than by board or brick walls.

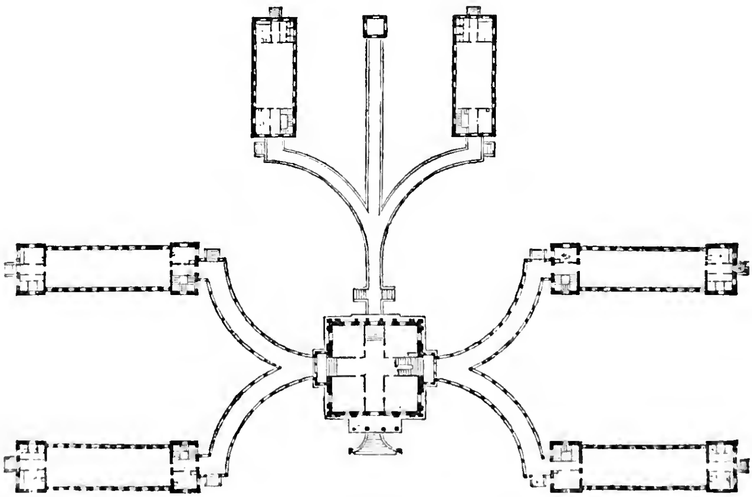
A full and interesting account is given by Dr. Hammond, with plans, of all the principal representative hospitals of Europe and of this country. The Lariboisière and Vincennes have already been mentioned as among the most celebrated for their excellence in many particulars. Those proposed to be built at Woolwich and at Malta, if the plans approved be carried out, will be admirable structures. For its size, the Pennsylvania Hospital in this city, with the improvements made a few years since, continues to be a model. The new hospital of the Protestant Episcopal Church of Philadelphia, is excellently planned, and in its details no doubt quite unsurpassed; although the combination of designs, introducing a chapel between the pavilions, must diminish somewhat its superiority in a sanitary aspect. We cannot, however, hesitate to follow Dr. Hammond in his unqualified praise of the Blackburn Hospital, of Manchester, England, and the Boston Free Hospital. The plan of the former, with enlargement of the wards (which are adapted only for eight beds), must admit of the freest possible circulation of air; the pavilions alternating, so to speak, along the sides of the corridor, and thus doubling the distance between those upon the same side. Nothing could be much better than this. Two military hospitals

[1] Notes on Hospitals, p. 58. [2] Hints on Health in Armies, p. 111.

in this country are upon this plan, slightly modified; the Mount Pleasant Hospital, and Judiciary Square Hospital, at Washington, D. C.



The Boston Free Hospital embraces six separate pavilions, radiating from a central structure, but entirely disconnected with this building excepting by corridors or walks, each of the quadrant of a circle in form. There are two parallel pavilions on each of three sides of the building, and eighty feet from it. The pavilions are one hundred feet apart in the clear. Each is two finished stories in height, with a basement. Four of them accommodate fifty patients each, the other two twenty-five. Each patient will have about one thousand six hundred cubic feet of space. The plan is designed for two hundred and fifty patients.

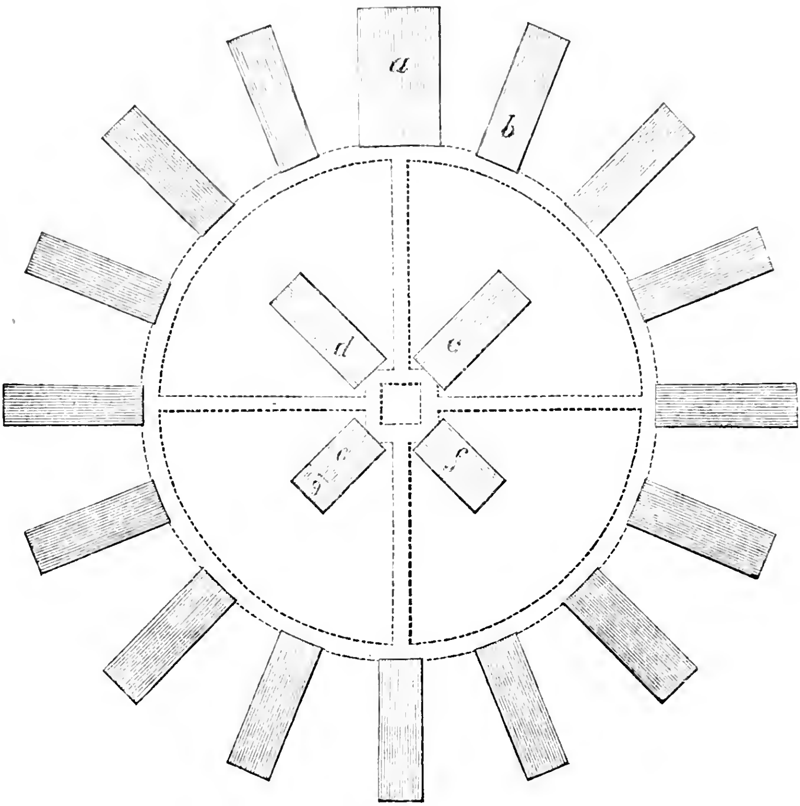


An extended and highly interesting description is also given by Dr. Hammond of the military hospitals of the United States; most of which have been erected under his administration, and by his immediate direction. The largest of these, and the largest hospital in the world for the sick and

wounded alone, is the Mower General Hospital at Chestnut Hill, near Philadelphia. It contains two thousand eight hundred and twenty beds for patients, besides five hundred for the officers and attendants. The wards are contained in fifty one-story pavilions, radiating from an ellipsoidal corridor: the latter being the circumference of an area of three hundred and forty-one thousand four hundred and sixty-six square feet. It is amply supplied with water, and lit by gas, and the drainage is complete.

The West Philadelphia Hospital accommodates, when full, three thousand one hundred and twenty-four patients. Its dimensions, however, are not quite equal to those of the hospital at Chestnut Hill. The pavilions, at West Philadelphia, are arranged on parallel rows on each side of a long corridor. The McClellan Hospital, at Nicetown, is composed of radiating pavilions, less crowded than at Chestnut Hill, connected with an elliptical corridor, and affording room for one thousand and forty beds.

The greatest excellence of design, however, appears to us to belong to the plan of the Hammond Hospital, at Point Lookout, on Chesapeake Bay. This consists of sixteen pavilions radiating from a circular open corridor. The pavilions are thirty-six feet distant from each other at the corridor, and seventy-five at the other end. One pavilion is for administrative purposes. Each of the fifteen wards contains fifty-two beds, making a total of seven hundred and eighty.



A view is given by Dr. Hammond (p. 381) of a design of Poyet (Paris, 1786) for a radiating hospital, to contain five thousand patients. This was never carried out. Some approach to it is made in a few of the Italian hospitals. Dr. Parkes[1] suggested a crescentic radiating plan; the half, as it were, of that of the Hammond Hospital. We are aware that all sanitarians are not agreed in approving of radiation in any shape or modification in the construction of hospitals; but, whatever secondary difficulties may occur in them, it seems that, if obstructive partitions are not allowed to check the flow of air throughout all the diameters of the circle, such a plan most nearly approaches the realization of the hospital ideal. This is expressed tersely by F. Nightingale: "All that has to be manufactured"—*i. e.*, all sorts of administration—"should be, as much as possible, concentrated into one; while human beings, sick or well, should be distributed as much as possible."[2]

Field hospitals, Dr. Hammond avers, are best composed of tents, both for summer and winter. The U. S. army hospital tent is fifteen feet square, and should not be made to hold more than six or eight men. The conical tent is not well adapted to hospital purposes. The best of all arrangements for hospital tents or huts is said to be *en échelon;* the distance between any two being twice the height. The floor of each tent should be raised a foot or eighteen inches above the ground, and this space left open to the air. Dr. Hammond has a very high opinion of the salubrity of tents or ridge-ventilated huts for the sick and wounded. Hospital gangrene has never, to his knowledge, occurred in our army, in a tent. It has been exceedingly rare in all our hospitals; although over one hundred thousand wounded, of loyal and rebel troops, have been treated in them.

The lighting of hospitals is well and scientifically discussed by our author. Some interesting experiments were performed by him to ascertain the amount of deterioration produced in the air by ordinary modes of luminous combustion. He proved that one average gas-burner causes more carbonic acid in a given time than is evolved from the respiration of eight adult human beings. In a ward where there are eight burners in use for three hours daily, they would produce as much vitiation of the air as ten patients; that is, if the contaminated atmosphere were allowed to remain without change. These facts show how important it is to provide means for the removal of the results of such combustion; a point very generally overlooked. Mr. Rutter's improvement of Sir Michael Faraday's gas-ventilator is described, with an engraving, as well as a simpler but not less effective substitute for it, consisting of a tin funnel, suspended over the burner, and communicating by a tube with the chimney of the room. This will undoubtedly assist in the general ventilation of the apartment.

A chapter is also given to the heating of hospitals. Stoves are very properly objected to on principle, as "exceedingly unfit for rooms in which invalids are confined." They are, nevertheless, "being economical and requiring little attention, used in the temporary military hospitals in the country." We must again venture to suggest our question of the real validity of such economy. We have learned on inquiry, that the expense of warming a hospital like that at West Philadelphia, for instance, in cold

[1] Brit. and For. Medico-Chir. Rev., April, 1860. A good example of this plan of building, not for hospital purposes, is seen in the Eastern State Penitentiary, at Philadelphia.

[2] Notes on Hospitals, p. 74.

weather, is enormous. Dr. Hammond considers it decided, that hot water, distributed in pipes, is superior to steam, or to any other means of heating large buildings. It is more uniform than steam, as well as more economical. Florence Nightingale prefers open fire-places to everything else.

We are thus brought to the topic of ventilation, which is admirably treated of by Dr. Hammond. Many of his facts are the result of his own carefully conducted experiments. Having recently examined the wards of several military hospitals, he found the one least ventilated to contain 2.11 parts of carbonic acid in 1000 of air. In the best, the proportion of this gas was 0.68 in 1000 volumes of the contained atmosphere, while outside it was but 0.37 in 1000. Le Blanc found 8 parts in 1000 at the Salpêtrière, and Ramon de Luna 4.3 parts in the General Hospital at Madrid. In a room occupied by three adults for two hours, the windows and doors being closed, Dr. Hammond found the air eight inches from the floor to contain 8.3 parts of carbonic acid in 1000; twelve feet above the floor, 6.8 parts in 1000. Organic matter, on the contrary, tested by a standard solution of permanganate of potassa, was much more abundant at the highest point, as it required, at the elevation of eight inches, eight hundred and sixty-five cubic inches of air to produce decolorization in a solution upon which the same effect was produced by six hundred and eighty cubic inches at twelve feet.

The importance, for healthy respiration, of a constantly *moving* and *changing* mass of air, is forcibly urged. An allowance of twenty cubic feet of fresh air per minute should be the minimum. Vierordt's statement is quoted as being only two and a half cubic feet. Experiments at the Lariboisière seem to point to four thousand cubic feet per bed per hour as a safe proportion.[1]

By actual examination, Dr. Hammond found the amount of carbonic acid in a room occupied by him while closed for six hours, and then aired by opening the window and door, reduced from 0.72 per cent., before airing, to 0.39 per cent. after fifty-five minutes exposure to draught; the latter percentage being the proportion of the outer air. He has also seen the air of a room containing five thousand cubic feet, entirely renewed in five minutes, by the windows and doors alone, when a moderate breeze was blowing. Surely, these facts argue much in favour of "natural" ventilation; a somewhat questionable *term* (especially in furnace-warmed houses), but a very desirable *thing*. Miss Nightingale well says, that "artificial ventilation is only a *pis aller;*" our grandfathers' lofty fireplaces being considered by her the greatest loss in modern architecture. As Dr. Hammond states, however, in this climate doors and windows cannot be left open in cold weather, and it is necessary to provide a more efficient ventilation of hospital wards in winter. The methods approved by him, and which have had the test of very extensive and successful application in a number of large pavilion military hospitals, are, for comparatively mild weather, the ridge-ventilation; for the coldest season, what might be called the stove-shaft. The former consists essentially in leaving an opening, ten inches wide, at the ridge of the pavilion along its whole length, this opening being covered by a roof projecting at least two feet on each side, and elevated about four inches above the lower floor. A narrow strip along the margins of the opening guard against the entrance of snow or rain (pp. 355, 395, 441). This plan was in use, under direction of the British Sanitary Commission,

[1] Florence Nightingale, op. citat., p. 100.

in the Crimea. For full effectiveness, it requires that the walls should be double, and that air should be admitted from without, near the floor of the pavilion or hut. The openings for fresh air into the ward should be covered with perforated iron or other metallic plates. This last is a most valuable provision, and one calculated to be of great service as an adjuvant to, or modification of, window ventilation. A draught may be checked by such a plate, put in the place of a pane in a window, and the air thus so tempered by subdivision that it may be safely introduced in the coldest weather. The plan of winter ventilation adopted by Surg.-Gen. Hammond for use where stoves are employed for heat, is also very simple. A hole is cut in the floor, under each stove, through this air enters, being conducted from the outside by a wooden box or flue under the floor. This fresh air is prevented from spreading, while cold, over the floor, by a zinc jacket which partially incloses the stove, and thus forces the current upwards along the heated surface, until heat enough is imparted to secure the proper effect. Impure air is carried out by means of a perpendicular wooden box, almost surrounding the stove-pipe, and emerging at the ridge of the roof.

The simplest idea of natural ventilation is, it appears to us, to keep every building and part of a building, in warm weather, as open as possible on all sides; and, certainly, the most rational principle of artificial ventilation must be to take advantage of the upward currents produced by the means resorted to for producing heat, and thus insure, with sufficient openings, a circulation of air. It is scarcely going too far to say, that no building ought ever to be constructed so as not to be capable of sufficient ventilation by either of these two modes.

Barracks and camps are discussed by our author with the science of an expert, clear and full statements being given of all that concerns their hygiene. The sanitary condition of the camps of the United States Army, during the rebellion, is said to have been, with some few exceptions, excellent; the general ratio of sickness being much less than was ever met with before in a large army engaged in active operations. Even during peace, as our author testifies, camps have seldom exhibited a more favourable state of health.

We forbear attempting the task of analyzing the nine remaining chapters of the volume before us, upon Alimentation and Clothing. These chapters might very well be made the subject of a separate review; indeed would require it, to do their author and our readers sufficient justice. They are well elaborated, not only with research, but with many practical applications of great value and much original matter, including the results of those physiological experiments and observations whose previous publication has made their author known in Europe as well as in this country as one of the leading physiologists of the age.

Dr. Hammond's style is uniformly easy, lucid, and agreeable, making what the general as well as the professional reader will find a very readable book. In his preface it is stated, that several subjects are omitted or postponed, whose consideration would have been appropriate to a work on Hygiene. We are confident that a demand will soon occur for another edition. With the opportunity thus afforded, it may be anticipated that Surg.-Gen. Hammond's matured work will be pronounced not only, as now, the most important Treatise on Hygiene in the English language, but the best extant.

H. H.

Art. XIII.—*The Pharmacopœia of the United States of America.* Fourth Decennial Revision. By authority of the National Convention for revising the Pharmacopœia, held at Washington, A.D. 1860. Philadelphia: J. B. Lippincott & Co., 1863.

Each appearance of the *United States Pharmacopœia* at decennial periods may be said to inaugurate a new epoch in the pharmacy of this country. The work is looked for with interest by the physician and the pharmaceutist as the guide by which he is to be directed in his endeavours to mitigate the evils of disease, and with the expectation that, while retaining all that is good and that has been sanctioned by the experience of the past, it has been rendered additionally worthy of reliance by embodying the contributions made to science in the interim of its previous revision.

The present issue has been more than usually delayed, and it would appear that the anxiety of the public to possess the work has not been diminished by the postponement of its publication. The inquiry for it has been general and emphatic, but perhaps with some want of appreciation of the effort entailed upon the compilers, to whom, as a task of love for science purely, and with the willingness to render their knowledge and skill profitable to their fellow citizens, the enterprise of garnering up and putting into form the pharmaceutical improvements of a decennial period has been intrusted. The revision and publication of this standard work is no small undertaking, and as stated in the preface, "the Committee of Revision and Publication have realized this fact in the large amount of labour they have encountered in duly examining the mass of materials, manuscript and printed, bearing upon the proper execution of their duties." In extenuation it may be further stated that the revision of the *British Pharmacopœia*, which was commenced some time before that of the United States, has not yetbeen fully completed.

It is our intention in the present notice to enter into an analysis of the modifications and changes which have been introduced into our new National Authority, and to make them as perspicuous to the reader as it is in our power to accomplish. The work is now before the community, and will be judged in accordance with its deserts. Its merits or demerits can only be fully estimated when practical experience has been brought to bear upon the numerous details which are presented, and time will be required for the just appreciation of them. Until this has been done no enlightened criticism can be indulged in.

With the view to facilitate the exposition of the alterations and amendments in the revision before us, it will be expedient to arrange them in their natural order, or in accordance with the purposes and objects designed to be attained in the construction of a Pharmacopœia. By so doing we will be enabled to exhibit methodically, under their appropriate heads, the various items, and to give to them the force which is necessary to their proper comprehension. Upon this plan each alteration or supposed improvement can be satisfactorily exhibited, with the statement of the reasons which have prompted its adoption.

A Pharmacopœia then may be stated to be designed, first, to present a *list* of all the medicines which may be profitably employed in the practice of medicine, including those which have been long used and sanctioned by experience, as well as others which have attained sufficient notoriety to

render them worthy of enumeration. Our own Pharmacopœia has classified medicines so as to pertain to the most important, which is called the *primary list*, or to a subordinate one which is termed the *secondary list.* When an article has remained for a sufficient length of time in the secondary, to test its value and to establish a decided reputation, it may be elevated to the rank of the primary list, or if it has gone into disuse, may be dismissed from either. In this way there is provision against redundancy, and yet safety in securing the use of a reliable article of the materia medica. We are informed that "the list of the Materia Medica has undergone the usual modifications of introductions and dismissions. Fifty-five medicines have been introduced, and twenty-six dismissed, as will appear by consulting the first and second tables appended to the work. Forty-two medicines have been added to the primary, and thirteen to the secondary list. It will be noticed that among the introduced articles a considerable number have not taken the usual course of promotion, but recommended, either by later authority than that of the previous revision, or from long unofficinal employment and the convenience of substitution, have been thought worthy of being made officinal. Chromic acid, canna, chiretta, yeast, ignatia, leptandra, carbonate of lithia, matico, pumpkin-seed, sulphate of manganese, molasses under the name Syrupus Fuscus, whiskey designated as Spiritus Frumenti, and a few others have been introduced, *de novo*, on the ground of strong testimony in their favour as remedial agents, while to others, again, as lactic acid, amylic alcohol, glacial phosphoric acid, stronger alcohol, orange flowers, belladonna root, commercial chloroform, gutta percha, &c., prominence has been given from the part they play in the formation of important preparations. Among the new articles of the secondary list will be found koosso, wahoo, yellow jessamine, cotton root, and kamala.

From the primary list thirteen articles have been dismissed, and a similar number from the secondary. The term Cinchona, as applied in a generic sense, has been discarded; and it will be found that the three varieties of pale, yellow, and red are alone authorized. There is much that can be said for and against this alteration in the mode of designating cinchona bark. So far as certainty can be secured by designating a specific variety of bark, to be used by the apothecary, the present limitation to the three mentioned will be useful; but there are other kinds which are of great importance, which are by this course not recognized as officinal, and which formerly were embraced under a general head as Cinchona. These are employed largely by the manufacturer, and it is not intended to preclude their use in medicine. Very inferior kinds, however, would be interpreted to be included under so general a term, and it is to preclude their substitution for the most valuable kinds that the present step has been taken; perhaps it is the wisest plan in order to obviate imposition. Most of the articles in both the lists which have been dismissed are intrinsically of little importance, or have given place to better forms of the same medicines. Lemon has been replaced by lemon-juice, and amber is not used in the shop, as the oil is made by the manufacturer, and has taken its place by the side of other articles.

In this connection it may be proper to state that such medicines, as by the subdivision of labour are now furnished by the manufacturer, are enumerated in the list of them, having been transferred from the preparations. Five articles are thus treated, and as all must admit who are engaged in the dispensation, judiciously.

In connection with an exposition of reliable lists of medicines their nomenclature is an important consideration, and this is based for the most part upon the language of the sciences pertaining to the source from which the articles are respectively derived. It is essential that the nomenclature employed should be brief, clear, and at the same time expressive; and while it is admitted that perfection cannot be attained in this somewhat changing particular, still it may be stated that the authors of the first Pharmacopœia strived diligently to attain this. It would be convenient, in this essential feature, if all analogous works in the English language presented uniformity; but the colleges of the British Empire have never conformed to the same principles with respect to nomenclature, and the authors of our work were therefore forced into the adoption of an independent method, embracing as far as possible the merits of all, with, it must be admitted, their own improvements. Aided by a better understanding of the views of each other, from inter-communication of pharmaceutical knowledge, there is no doubt that when the single British Pharmacopœia makes its appearance, a greater uniformity will be observable between it and our own with respect to nomenclature. The changes which are noticeable in the new revision are either general, involving a principle; or they are particular, pertaining simply to the change of name. The singular number has been adopted in the place of the plural: thus Folium has been substituted for Folia, in association with aconite, belladonna, &c.; and this applies not only to the Latin, but as far as practicable to the English names: thus almond is used for almonds, cubeb for cubebs, fig for figs, nutgall for galls, &c. Where several varieties of an article were formerly placed under a single name, this has been dropped and the special kinds designated: thus Aloe has been dropped and Aloe Barbadensis, Aloe Capensis, Aloe Socotrina, introduced in the place of it. The generic name of the plant has always been assumed for the medicine where only one species is employed, while if several were used the specific names designated the varieties of the medicine. In reducing the varieties to a single one this rule has been exemplified: thus it has not been deemed essential to designate all the species of Erigeron, and that name has been made to subserve the purpose, so also with Asclepias and Rubus. An exception occurs in the case of Ulmus, which has been altered to Ulmus Fulva. On the contrary, the generic name has been broken up, as it were, into specific names, where these are more definite with reference to the article, as in the case of Sinapis, which has given place to Sinapis Alba and Sinapis Nigra. Where again only one portion of a plant is retained as efficient, the generic name is solely used instead of the portion of it: thus Althæa replaces Althææ Radix; Conium is used for Conii Folia. Some names have been entirely altered, as, for instance, Calumba is substituted for Colomba, Vinum Xericum for Vinum Album, and Vinum Portense for Vinum Rubrum.

Alteration of nomenclature is not confined to the lists of medicines; it is found in the preparations also. The termination uretum, except in sulphuretum, has been altered to idum, which gives the new titles "cyanidum" and "ferrocyanidum." Antimonii Sulphuretum Præcipitatum has been changed to Antimonium Sulphuratum, in consequence of the want of precision in the ingredients of the compound. Ferrum now comprises all forms of pure iron, and the time-honoured and time-sanctioned Dover's powder has been altered from Pulv. Ipecac. et Opii to Pulvis Ipecacuanhæ Compositus. As the Spiritus Ætheris Nitrici does not contain nitric acid, but the nitrous acid of the new arrangement of the compounds of nitrogen

and oxygen, it is now most satisfactorily denominated Spiritus Ætheris Nitrosi. Another change of name to which allusion ought to be made is of the iodide of mercury to green iodide of mercury. With respect to the names of salines the gender has been changed from masculine to feminine, "as conforming to the best latinity;" and hence, when adjectives are used in connection with them, a corresponding change of the name is exhibited: thus Argenti Nitras Fusus is converted into Argenti Nitras Fusa, &c. This alteration has been long called for by those whose classical nicety was offended in previous editions.

There is another circumstance to be noticed before dismissing this topic of alterations in nomenclature. There existed a series of English names, handed down from time immemorial, derived from vulgar sources, which in reality had no other merit than their habitual employment, and yet without accomplishing any definite purpose, while at the same time many officinal names were made to indicate the same substance as well in English as in Latin. This latter practice has been extended, and it is questionable whether the whole collection of English vulgar names might not have been profitably dispensed with. Angustura and Cascarilla well express the substances to which they are applied; to which have now been added Arnica instead of leopardsbane, Calamus for sweet flag, Digitalis for foxglove, &c. By this method we are freed from the synonomy and homonomy, which have been the bane of nomenclature, and which have led the public to think erroneously that prescriptions should be written in the vernacular, without comprehending that the full adoption of the language of science in the place of the vernacular affords greater safety to the community.

The next object of a pharmacopœia is to present the best forms for the administration of medicines, and in connection with them the most approved formulæ for securing efficiency in the officinal preparations. The alphabetical arrangement has been followed in grouping the preparations, which upon the whole has the advantage of simplicity and convenience, and to some extent admits of scientific order. In every case of a metal or chemical substance, this, however, does not permit all of its preparations being placed under the general head; thus, for instance, the tincture of the chloride of iron, instead of being placed under the head of Ferrum, has necessarily to be separated and placed among the tinctures. A greater observance of the alphabetical arrangement in the classes will indeed be observed in this edition than heretofore: thus the tinctures of iodine may be further cited as being found, not under iodine, but in the class mentioned along with such as are prepared from vegetable substances. A similar transposition will be discovered in Liquores and other classes. Had a more strictly scientific plan been adopted it would have been impossible to avoid all incongruity.

In table third a list is given of the new preparations that have been introduced, which amount to the large number of *one hundred and eleven.* They are to be found throughout the book under their appropriate headings. Many of these medicines have been thought to present better forms for administration than some from the same article of the materia medica long employed, while others again are so clearly improvements as to induce a substitution of them for former preparations. Under the title of Iron will be found chloride, citrate of iron and ammonia, sulphate of iron and ammonia, tartrate of iron and ammonia, citrate of iron and quinia, lactate of iron, pyrophosphate of iron and dried sulphate of iron, while under the head of Liquores will be noticed the solution of the citrate of

iron, solution of subsulphate of iron, and solution of tersulphate of iron, all being novel in this revision, and with the old retained preparations of this metal, affording infinite latitude of selection. One may, in fact, conclude either that physicians have not lost faith in this article, or that the age of iron has come again. The iodide of iron has been dismissed in consequence of the difficulty of preserving it, and for the solution of the same the syrup has been substituted, as the chemical character is best retained in this form.

Among the other preparations made officinal, may be observed purified aloes, valerianate of ammonia, atropia and its sulphate, sulphate of cadmium, sulphate of cinchonia, valerianate of quinia, and valerianate of zinc. Some more of the new preparations we shall have occasion to comment on when giving a cursory view of the modifications connected with the classes themselves. The preparations dismissed amount in all to thirty-seven; many of them have become obsolete, while others have been replaced by better. Prepared calamine has been removed in consequence of the universally sophisticated nature of the article supplied by commerce, and the precipitated carbonate of zinc directed in its place, the Ceratum Calaminæ as a consequence has fallen with it. The pulp of purging cassia is not needed, as the fruit itself is directed in the confection of senna. Infusion of sarsaparilla is not required, and the above reasons may be given with respect to the entire list.

The classes of preparations, it will be perceived, have been remodelled; this has been called for by the number of the preparations introduced, and thought to be expedient in interpolating them with the old. A necessity for change has also been entailed in consequence of the adoption of some new principles of grouping. As this feature of the work may give rise to some embarrassment, it will be well to dwell sufficiently upon it. Each class is designated by the name of the preparation, latinized, in the plural, according to the usual system, or by the name of the substance constituting the preparation and its combinations, or by the name of the substance which is the basis of all the preparations included under it. Hence we have Aceta, Æthera, Aquæ, Decocta, Emplastræ, Extracta, &c., as classes, but we have Aloe, Ammonia, Atropia, Carbo, Collodium, Morphia, Quinia, Strychnia, &c., also as classes. The remainder of them are designated by the name of the metal to which they belong, and under such designation come not only saline bodies of the metals proper, but the alkalies and their combinations; thus under the class Hydrargyrum will be found the preparations of mercury, while under those of Sodium and Potassium will be discovered the salts of soda and potassa; such simplicity of arrangement has only been possible in these latter times, and certainly is remarkable as an evidence of the advance and precision of chemical science. In the name of the classes an alteration has been made in a number of instances, thus, Aquæ Medicatæ is replaced by Aquæ, and Vina Medicata by Vina, and Carbo Animalis by Carbo, Collodium has been made a class, and the class Liquores is peculiar to this revision. In the former editions Liquores or solutions were placed under the head of each substance which they represented, but as they have attained some number, there exists no reason why they should not be collected and made to represent a class. This alteration has been made upon the principle of presenting in the form of aqueous solution fixed bodies, all of chemical origin, while the class of Aquæ embraces solutions of volatile matter. To follow this rule it was necessary to call Aquæ Calcis, Liquor

Calcis, while Liquor Ammoniæ has been again placed under the designation of Aqua, from which, in our opinion, it should never have been taken. One anomaly exists in the class of liquores, which is that of Liquor Guttæ Perchæ, a solution of the substance in chloroform.

Two other classes are new to this revision, viz., Oleo-resinæ and Resinæ. As stated in the preface, these "have well defined characters, and their introduction will meet with general approval. The oleo-resins were formerly confounded with the fluid extracts; of the five that are given, those of capsicum, lupulin, and ginger, are newly introduced. "The three resins, those namely of jalap, may-apple, and scammony, appear in the Pharmacopœia for the first time."

A remarkable peculiarity of the work is the great increase of the class of fluid extracts. It would appear as if fashion had exerted its influence in this direction, still there is much that can be said in their favour, the smallness of the dose that can be given, from concentration of the active elements, and their convenience of employment in the place of other preparations, as well as for combination in prescriptions, render their possession highly important. There was nothing more difficult in past times than the administration of cimicifuga; the fluid extract of it now subserves the best purpose. The old fashioned infusion of senna may be dispensed with, and the fluid extract used for all its objects. In the case of ipecacuanha, the fluid extract will be found more effective than any other article. Another article to which we may refer, is the fluid extract of colchicum seed and of the root. Nineteen pages of the book are given to these preparations, on which is recorded the method of forming twenty-five of them. Alcohol, or diluted alcohol, is the menstruum used in all of them, and to a few a small quantity of acetic acid is added. The menstrum used in the oleo-resins is ether, which serves likewise as a mode of distinction between them and the fluid extracts.

In the alterations that have been made, some old and familiar preparations will be discovered under new titles. Thus it may be thought that soap liniment has been forgotten, yet it will be found not as Tinctura Saponis Camphorata, but as Linimentum Saponis, among the liniments; Unguentum Simplex is now Unguentum Adipis, and Ceratum Simplex is Ceratum Adipis. It should be observed that the Liquor Potassæ Citratis has been renamed Mistura Potassæ Citratis, which comports better with the common name neutral mixture. Under the head of spirits and tinctures there have been made several, as we conceive, judicious transpositions. Thus, the awkward designation of Tinctura Olii Menthæ Piperitæ, has been changed to Spiritus Menthæ Piperitæ, and so of Menthæ Viridis. It may be stated here that the elegant Spiritus Ammoniæ Aromaticus has been transferred to the class of Spiritus. Bay rum will also be found as a new preparation in the primary list, under the title of Spiritus Myrciæ, from the name of the myrtle plant from which distilled, the Myrcia Acris. In explanation of some of the alterations in the English names of preparations, it is stated that two plans were originally adopted in designating the cerates, liniments, mixtures, pills, plasters, and ointments:—

"Sometimes the initial word of the officinal title is the name of the chief substance present in the preparation; at other times it is the name of the class to which it belongs. Thus the Pharmacopœia of 1850, has camphor liniment and liniment of turpentine, ammoniac plaster and plaster of ammoniac with mercury, stramonium ointment, and ointment of belladonna, sulphur ointment and ointment of iodine, &c. In cases like these the committee have preferred

the nomenclature which gives precedence to the name of the class to which the preparation belongs, and accordingly they have made forty changes of this kind. The rule, however, was not made absolute, but exceptions were admitted in a few cases in which the present names have been settled by so long usage as to make it inexpedient to change them."

While new classes have been made, containing, perchance, but a single preparation which has given rise to it, others formerly containing but one have been enlarged; thus under the denomination of Bismuthum we find the subcarbonate added to the subnitrate, under Strychnia, the sulphate has been introduced, under Aluminium dried alum and the sulphate of alumina, while alum itself has been transferred to the primary list as a manufactured commercial article. Collodium having been removed from the ethers, has been made the type of a class containing it and collodion with cantharides.

The alterations made in the formulæ must now occupy a portion of our attention. The Acetum Opii has been slightly altered in composition. According to the old formula, it contained $73\frac{1}{13}$ grains of opium to the fluidounce; it is now directed to contain 75 grains, which is exactly twice the strength of laudanum. The tinctures of opium in the former revision have been left undisturbed, but a new one has been made officinal under the name of Tinctura Opii Deodorata. It is to a certain extent a reproduction of the denarcotized laudanum. The difference, however, consists in the formation, in the first instance, of an aqueous extract, separating from this the narcotina by means of ether, and then by the addition of the proper amount of water and alcohol producing a diluted tincture. It is intended as a substitute for the nostrums now in the market. It will be observed that diluted hydriodic, diluted nitromuriatic, diluted phosphoric, and sulphurous acids are new preparations, the formulæ for which have been carefully prepared. The object of introducing commercial chloroform into the primary list of the materia medica was to direct attention to the difference between it and the purified article, which alone should be used for medicinal purposes. Under the designation of Chloroformum Purificatum which is the same as Chloroformum of the revision of 1850, a formula is given for the preparation from the common commercial article. This is so important a subject that sufficient stress can hardly be laid upon it. A formula is given for the Extractum Ignatiæ. This preparation has of late years become exceedingly popular with physicians, but made from no definite formula. It is now presented in a reliable form as a substitute for the extract of nux vomica, from which it differs in containing more largely of brucia. It will be noticed that a new process has been adopted for the formation of the subnitrate of bismuth. The carbonate has been introduced, but it is prepared previously to the production of the present preparation, and used in its formation. The object of this process is to avoid the adulteration or presence of arsenic, which has in certain cases complicated the attempt to determine the source of arsenic found in the stomach, a subject some years since brought before the notice of the College of Physicians of Philadelphia, by Prof. R. E. Rogers, and which has attracted attention abroad. In the confection of senna it will be seen that the liquorice root has been discarded, while some little alteration has been admitted with respect to the other ingredients.

The tartrate of antimony and potassa is directed to be prepared by an entirely different process from that formerly used. A pure oxide of antimony is in the first place prepared and substituted for the oxychloride hitherto directed. This has also been introduced as an officinal preparation. To

prepare the oxide, the precipitate of the oxychloride is formed in the usual way, but subsequently washed with water of ammonia. The object of this alteration of the process is to give a purer, and at the same time, as directed by the Pharmacopœia, a more economical product. Under the class Mellita is given a formula for Mel Boracis, which is a convenient preparation; and among the Pills will be found the formula for Plummer's pills under the designation of Pilulæ Antimonii Compositæ. With respect to syrups it will be perceived that some useful modifications have been adopted. The simple syrup formula has been remodelled and a slightly weaker preparation formed, which renders it, if any change is effected, less liable to candy. Distilled water is directed and the process improved.

A substitution has been made of the Tinctura Cardamomi Composita for the Tinct. Cinnamomi Composita, which is an admirable change, the former preparation, not heretofore officinal, being a more elegant one, and both not being wanted. Under the class Unguenta, ointment of benzoin has been adopted. It is simply lard flavoured with the volatile ingredients of benzoin, and affords an aromatic basis for compound ointments extemporaneously directed. There has always been complaint with respect to the irritating nature of gall ointment, from the difficulty of reducing the nutgall to a sufficiently fine powder; as a substitute in case of irritable piles the ointment of tannic acid may be used, which has additionally been made officinal. Tobacco ointment has a better formula than in the old revision. It is made with a watery extract of the drug. We may in concluding our remarks upon the preparations, advert to an error to be found in the formula for wine of ergot. Instead of the two troy ounces in it, four should have been directed: this is an inadvertence that can be corrected in the stereotype plates very readily.

We must now pass to the remaining points to complete our notice; and the first to which attention may be directed, intimately connected with the formulæ for the preparations, is Weights and Measures. The question, which system of weights is most appropriate for a Pharmacopœia, is a *quæstio vexata*. In England it appears to have given rise to much perplexity. The Dublin College has adopted the avoirdupois weight, but as it is understood, this system, after finding favour with the framers of the *New British Pharmacopœia*, has been discarded in consequence of the outside pressure that has been brought to bear against it. There is no doubt of the advantage of having but one set of weights, both for buying and selling, and for medicinal preparations. Yet in England and this country custom has so irradically sanctioned two that it is important to diminish the evil as far as possible. The main difficulty is to abolish the avoirdupois from the shop of the apothecary, who has the advantage of the lighter ounce pertaining to it in his sales, while inadvertently or by design this may be used in the preparations. To obviate this latter contingency all intermediate weights between troy grains and troy ounces have been discarded, and to bring constantly before the mind of the apothecary the fact that troy weight is intended, the term troy is used as the prefix to the words ounces and grains. There is here no obscurity, and the avoirdupois ounce cannot be honestly resorted to. It is singular that full sets of the troy weights are rarely kept in the shops, and above the drachm, cannot be found. As they can readily be procured in accordance with government standards, for this there is no excuse. With respect to this point we are told by the committee that the subject was a perplexing one.

"The final conclusion come to as to weights was to use exclusively in the formulas the grain and the troy ounce, the latter always printed troyounce, as one word. The term *pound* has been disused in them, in order to avoid the liability to mistakes from confounding the troy and avoirdupois pound; and the new word *troyounce* distinctly indicates a weight of four hundred and eighty grains, which cannot be replaced by the avoirdupois ounce through ignorance. Wine measure, as heretofore, is employed in all the formulas; the only change being the disuse of the term gallon, which measure, whenever it occurs in the Pharmacopœia of 1850, is expressed in pints. The adoption of imperial measure would have secured the advantages of uniformity with the liquid measure used throughout the British empire; but so long as the United States continue to legalize the wine measure, it is proper that physicians and apothecaries should conform to it."

Further, under the head of Preliminary Notices some directions are given which should not be overlooked. Thus, by gentle heat is meant any temperature between 90 and 100°; and when the specific gravity is mentioned the temperature assumed is 60°. The exact designation of the term saturation, and the direction for stoppage of bottles should be attended to. The specifications for *percolation* and the *process of displacement* have been rewritten. The difficulties which invest this mode of exhausting substances of their active principles, must be removed by the plain directions which are there given, and as this mode is more universally employed than previously, it must be completely comprehended to render it available. In connection with displacement it is proper to state that when the word "macerate" is employed, it means simply to soak or steep, without any reference to temperature; and when the word "digest" is used, it means in connection with soaking, the maintenance of a temperature from 150 to 200° Fahr.

Precision has also been introduced with respect to the "Fineness of Powders." "For this purpose the terms very fine, fine, moderately fine, moderately coarse, and coarse, are used—the powder passed through a sieve of eighty or more meshes to the linear inch, being designated as—*very fine*, through one of sixty meshes *fine*, through one of fifty meshes *moderately fine*, through one of forty meshes *moderately coarse*, and through one of twenty meshes *coarse*. For the convenience of apothecaries, sieves so constructed and labelled might be introduced, and the above terms thus stamped upon the minds of all manipulators in medicinal articles.

A point ought to be adverted to which has been considered of some importance by pharmaceutists. It is the accentuation of the Latin pharmaceutical names, which will be found in the index.

We here close our somewhat lengthy review of the revision of the United States Pharmacopœia of 1860. First and last, at least five years have been occupied by the various societies who have contributed to it, and by the Committee of Publication. That every pains has been taken to render it worthy of the scientific bodies engaged upon it, and of the nation, there can be no doubt. It has cost much labour, research, and reflection, and in the same spirit with which the work has been executed must it be criticized. The motto which might have been appropriately adopted for the title page, and which would have a prospective signification with reference to the next revision, is

"Si quid novisti rectius istis
Candidus imperti; si non his utere mecum."

J. C.

Art XIV.—*A Clinical Treatise on Diseases of the Liver.* By Dr. Fried. Theod. Frerichs, Professor of Clinical Medicine, formerly in the University of Breslau, and now in the University of Berlin, etc. etc. Translated by Charles Murchison, M. D., Fellow of the Royal College of Physicians, London, Assistant Physician to King's College Hospital, and to the London Fever Hospital. The New Sydenham Society, London, 1860. 2 vols. 8vo., pp. 402 and 584.

The student of psychology, of the operation and results of our faculties when trying to find out how the Creator produces results in this material universe, will find a great deal of interest in the historical introduction to this clinical treatise on diseases of the liver. Seventeen hundred years ago, Galen gave a very complete account of the organization and functions of the liver, which was generally received and scarcely at all modified for fifteen hundred years. He regarded the liver as a blood-making organ, described the metamorphosis of the blood as commencing in the portal veins, and completed in the liver. The discovery of the lacteal vessels, in 1622, and of the thoracic duct, in 1647, of canals by which the assimilated juices contained in the digestive cavities could be conveyed to the blood-vessels and mixed with blood, seemed to place the liver out of the way of the process of sanguification. The function of the veins to take up the juices recently introduced into the economy or resulting from the disintegration of tissues, was transferred to lacteals and lymphatics. The portal vein carried blood from organs of digestion, which was purified by the excretion of the bile and then sent to the lungs. The liver was then regarded as an organ of excretion. Harvey's discoveries of the circulation of the blood confirmed these views, and those who tried to uphold the former views were but few and but little regarded. These opinions prevailed for nearly two hundred years. Our author quotes Boerhaave's observation, "Dudum in meliori partre Europæ (obsolevit), hæc sanguificatio nunquam ab eo viscere expectanda." Magendie, Tiedemann, and Gmelin, physiologists of this century, proved that their immediate predecessors were mistaken, and that the ancients were right in regarding the liver as playing an important part in the manufacture of blood, and in the assimilation of matters taken into the digestive cavity. Galen's views, modified and circumscribed, were re-established. Blondlot, Claude Bernard, Lehmann, Schmidt, and Ludwig, have made the liver an especial object of experiment and study. They have proved that water, salts, sugar, odoriferous and colouring matters get to the blood through the veins, whilst the greatest part of the fat passes into the lacteals. Other observers, as Reichert, Weber, Kölliker, are trying to find out what is done by this organ to the corpuscles of the blood, what part is taken in manufacturing them. Bernard, feeding animals on nitrogenous food, found sugar in the hepatic veins, and attributes to the organ a function of sugar-making; and though by subsequent observers the work of the organ is regarded as ceasing with preparing a substance easily transformed into sugar, but more particularly destined for the manufacture of fat, yet the importance of the organ in secretion as well as in excretion is none the less established. That the complex atoms of the albuminous principles undergo other changes in the liver has also been shown, and Claude Bernard sustains Galen's views of the important work done by the organ in the manufacture of animal heat. In the last number

of this journal for the last year, there were published most important experimental researches into a "new excretory function of the liver," in which the office of the organ in purifying the blood is more clearly defined, and the bile is shown to be a compound fluid containing cholesterine taken up out of the blood where its presence is injurious, as well as recrementitious salts, the glycocholate and taurocholate of soda, which are manufactured by the liver itself, and are concerned in processes of assimilation. Thus are the functions of the liver being ascertained and defined. The idea of the organ being concerned in assimilation and nutrition, dates back to the days of Hippocrates and Galen, and yet within this last year, Dr. Austin Flint, Jr., has made important contributions to the establishment of these views. His two propositions are: "First, that the bile contains the glycocholate and taurocholate of soda, which are not found in the blood; are manufactured in the liver; are discharged mainly at a certain stage of the digestive process; are destined to assist in some of the nutritive processes; are not discharged from the body, and, in fine, are products of secretion; and, secondly, that the bile also contains cholesterine, which is found in the blood; is merely separated from it by the liver, and not manufactured in this organ; is not destined to assist in any of the nutritive processes, but merely represented to be discharged from the body, and is a product of excretion." Thus do we surmise and conjecture at truth; thus is it mixed up with errors, and so slow is the process of proving, settling, and separating. Dr. Flint tells us that the physiological history of the bile remains to be written. Is it not noticeable that so large and so important an organ of the body should be so imperfectly known and described, when it has been the object of study and research for so many hundred years?

Now, this fact, that the anatomy and physiology of the liver are still so imperfectly known, must be borne in mind when we examine a clinical treatise on diseases of the organ. Pathology is dependent on anatomy and physiology, and advances *pari passu* with the other sciences. In a *clinical* treatise we look for sound pathological views, as well as for a record of details observed at the bedside and in the autopsy room. The anatomy of the liver is more complete and better defined than the physiology. Its vessels, its cells, its connective tissue have been carefully studied by the aid of the microscope, and accurately described. But, whilst we recognize that the organ has an important part in secretion, excretion, sanguification, metamorphosis of tissue, production of animal heat, exactly what that part is, and how much it is, remain yet to be determined. The symptomatology of the organ must then be imperfect. The digestion, the nutrition of a patient is impaired, excretion is imperfectly performed, but we cannot yet say which of the various organs concerned in these processes is in fault primarily or principally. Pathological anatomy tells us of exudation of lymph, blood, and pus in the organ, it describes results of inflammation, it shows the exudation of cancer and tubercle, it tells of fatty and pigmentary degeneration, of hypertrophy and of atrophy, but the symptomatology, etiology, and therapeutics, in connection with these various lesions, are very obscure, uncertain, and imperfect.

A scientific work on the pathology of the liver is an impossibility in the present state of our knowledge. We must be very thankful for the clinical treatise of Dr. Frerichs, for which he claims that scientific medicine constitutes its groundwork. He tells us also that in the plan of his work he has had anatomy and physiology less in view than medical practice. The more important diseases of the liver are treated of in the second volume; those which

would first be considered had we the means of making a truly scientific treatise. There was an interval of two years between the publication of the first and that of the second volume. The first chapter of the first volume is occupied with a historical introduction; in the second chapter we have the size and weight of the organ in health and disease, whilst in the following chapter the diagnostic value of abnormal sizes and forms of the liver is ably discussed. There is a great deal of interesting matter in these two chapters, but we will proceed to the next, where, in a hundred and twenty octavo pages, the subject of jaundice is brought before us in several sections, the first of which is devoted to a historical account, and the second to the theory of the affection. The yellow tinging of the skin, and of several of the secretions by bile pigment, is the only attempt we find at a definition of the term. Of the sixteen ingredients which chemists find in the bile, biliverdine or colouring matter is the most recognizable to the unaided sight. We may admit that it is manufactured by the liver out of the colouring matter of the blood; and that, when this work is not done by the liver, the skin, the conjunctiva, and the renal secretions become the recipients of the pigment. But whilst this colouring matter is the most easily recognized ingredient of the bile, it does not compose that fluid, nor can we regard it as the most important ingredient. We must admit that in some cases other functions of the organ are performed, when the skin is yellow, and, that in other cases, with a skin, a conjunctiva, and a renal secretion of the normal colour, we have reason to believe that the patient is suffering from failure of the liver to perform the office of secretion and sanguification. Dr. Flint's researches come to our aid here, and we miss in Dr. Frerichs' treatise that distinct recognition of the different ingredients of the bile as both a recrementitious and excrementitious fluid, so clearly set forth by Dr. Flint in his admirable paper. Thus, we read in his treatise, that

"Jaundice from reabsorption forms the sure starting-point for further pathological inquiry, and in all cases and forms of the affection where it is practicable, the main question is to search for mechanical obstructions preventing the escape of the bile, or for other causes of the passage of this fluid into the blood. It is only when this is impossible that we can consider other theories of which a positive confirmation has hitherto been impossible, and the main value of which consists in the necessity for some hypothesis for explaining our observations. In such cases can we ascribe the jaundice to an accumulation of bile in the blood owing to something which interferes with its secretion, or are we to adopt the theory of a direct crumbling down of the blood-corpuscles or red matter of the blood into bile pigment?

"The production of jaundice from an imperfection in the secreting functions of the liver, which Budd and Bamberger have spoken of in recent times, without, however, bringing forward any striking proofs of the assertion, is opposed by too many well-established facts for us to support it. All the means for detecting traces of the essential elements of the bile in the blood generally, and in that of the portal vein in particular, have been exhausted without any result; neither the colouring matter, nor the acids of the bile, substances for which we possess tests of considerable delicacy, have been found.

"In the same way that urea accumulates in large quantities in the blood in granular degeneration of the kidneys, so ought the biliary acids and bile pigment to accumulate in the blood in cases of granular liver."

Now, Dr. Flint maintains, and, as we think, successfully, that cholesterine is the ingredient of the bile corresponding to the urea of the urine. This pre-exists in the blood, is derived from the disintegration of nervous tissue. The glycocholate and taurocholate of soda are manufactured by the liver, do not pre-exist in the blood, are never found in it under any

circumstances. They subserve for assimilation, and, when they are not secreted, assimilation will be defective. But when cholesterine is not excreted then poisonous matter accumulates in the blood, as urea accumulates with suppression of urine; and, whilst a certain amount of these substances in the blood is consistent with health, a greater amount is pernicious, and a still greater amount deadly. Now neither is cholesterine nor are the salts of the bile identical with its colouring matter, any more than urea is identical with the colouring matter of the urine. And we do not yet understand the relations they sustain to each other. In some cases of jaundice we do not detect symptoms of a deficiency in the secretion or the excretion of the liver. The assimilation is not defective, there is no evidence of cholesteræmia; whilst, in other cases, digestion is imperfect and the nervous system is oppressed by a poison. Nor can we distinctly connect the different anatomical conditions of the liver with a failure in its functions.

Dr. Frerichs has done well in taking up jaundice at the outset of his researches, because our knowledge of the organ is so imperfect. There are certain lesions, obstructions of the bile ducts, which interfere with the bile being discharged into the intestinal cavity, containing the assimilative juices and the seat of digestion, as well as a canal with a capacious outlet from which refuse, superfluous and poisonous matter escapes from the body. In these cases the cells and canals of the liver may hold for a while the excretion, or it may be absorbed into the body and removed by the skin, the kidneys and other excreting organs. We find cholesterine in the blood, brain, nerves, crystalline lens, meconium, in the fluid of hydrocele, and of ovarian cysts, in crude tubercle, in cancer, in epithelial tumours, in pus as well as in the bile and in the liver. The passage of this substance from the liver into the intestinal canal may be prevented for some little time, and nature can dispose of it in other ways, life being continued. Still, these arrangements are but temporary and incomplete; the patient suffers and finally dies. But the patient also suffers and dies where there is no obstruction to the ducts. The liver must be properly supplied with blood of the right kind and with nervous power to perform its functions of secretion, excretion, sanguification and assimilation. We have jaundice from pyæmia, from typhus, from yellow fever, from bilious fevers; we have epidemic jaundice. The word itself, so much associated with the presence of the colouring matter in the skin, expressive of and leading to a consideration of the failure of the liver to perform only one of its many functions, is unfortunate.

Dr. Frerichs' fifth chapter is on acholia, suppression of the functions of the liver, but has he a right to use these terms as synonymous? The secretion of the bile is one function of the liver, and if we distinguish this fluid as both excrementitious and secrementitious, as subservient to processes of assimilation of the food as well as to purification of the blood, and if we ascertain and recognize exactly how in the formation of this fluid the liver's share in sanguification, in animal heat is performed, then we may find that acholia, a non-secretion of bile, is identical with a suppression of the functions of the liver. We certainly seem now to be in the way of analyzing these complicated functions. There are many physiologists engaged in this study, and many pathologists are recording and analyzing cases where structural changes in the liver were found after death. In Dr. Frerichs' article on jaundice from snake-bites, he mentions the theory of older physicians, that this form of jaundice is owing to a spasm of the bile ducts, and he refers to that of Fontana, a liquefaction of the bile resulting from putrid decomposition, neither of

which are supported by recent observation. He calls attention to Bernard's experiments on the action of curare, which gives rise to congestion of the liver and to the excretion of sugar in the urine. And it must be in the same way that the poison of yellow fever gives rise to jaundice, acting on the nervous system, which presides over the circulation, and thus interfering with secretion and excretion. A change of colour of the organ, a fatty condition, have been noted by pathological anatomists; we may admit hyperæmia to have been present, but we have no evidences of nor can we believe in important modifications of structure as occurring in so short a disease. How far, then, is the fatal result to be attributed to what Dr. Flint calls cholesteræmia, to the non-performance by the liver of its function of excretion? The black vomit in this disease is now attributed to uræmia. The circulation in the kidneys is disturbed, they do not remove the urea from the blood, the glandular system of the stomach undertakes this office, but, so great is the congestion, that the distended vessels relieve themselves of their contents, blood is poured into the digestive canal, mixed with its juices, and then is vomited. Suppression of urine is given as a most unfavourable symptom in this disease. Thus we seem to know more of the effect of the poison of yellow fever in interfering with the renal than with the hepatic function, whilst in the description of its lesions, the condition of the liver is more conspicuous than that of the kidney. And we need information of the effect of other poisons. Jaundice is a symptom of relapsing fever, given as a diagnostic symptom, and yet we sometimes have a yellow skin in typhus and typhoid fevers. This question may be asked, how far are those symptoms called typhous, nervous prostration, weakness, unconsciousness, to be attributed to the liver ceasing to excrete; or how far from the poison acting directly on the nervous centres of circulation and nutrition? Cholesterine seems to result from the disintegration of nerve-substance, connected with an active function; and we want a quantitative analysis of the blood and feces in patients dying in a typhous condition, to aid in the answer to these questions. Dr. Flint does not find cholesterine in feces. It becomes changed into stercorine, which, like cholesterine, is a non-saponifiable fat. Ten and a half grains were found in seven and a half ounces of feces, the dejection of a healthy male; but, this quantity varies, and we do not yet know the correspondence between the amount of cholesterine in the blood and of stercorine in the feces. Dr. Flint gives the following table to show the correspondence in the amount of cholesterine contained in the bile and the amount of stercorine discharged in the feces:—

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| Quantity of bile in the 24 hours . . . . | 16.940 grains. |
| " cholesterine at 0.618 pts. per 1000 | 10.469 |
| " stercorine discharged . . . . | 10.417 |

The difference here between the amount of cholesterine and of stercorine is only a little more than five per cent. of a grain. Now, we want more analyses of this kind, as well as analyses of the blood for cholesterine in patients with these different fevers, and in different forms of these fevers. Cholesterine instead of stercorine should be expected in the feces of patients where digestion is suspended, as the change from one substance to the other seems to be connected with the performance of this function. In hybernation the feces contain cholesterine and little or no stercorine.

We have dwelt on these researches of Dr. Flint to show how much light is thus thrown upon those cases where the liver does not perform its functions as an excreting organ, since the publication of Dr. Frerichs' work.

He did not distinguish between the excretion and secretion of the bile; he looks too much to the presence or absence of the colouring matter of this fluid in other parts, as the evidence that the liver is or is not performing its various functions. Still, his remarks may be read with interest and profit, and he has collected what was known, and has recorded observations of his own in such a way as to constitute an important advance in pathology.

His article on acholia is followed by and connected with those on acute and chronic atrophy of the liver. Here we have a most efficient and intelligible cause of jaundice. If the nutrition of an organ fails, if its secreting and excreting cells disappear, its functions must cease. Five cases are recorded in which atrophy of the liver was found after death, and these are called illustrative cases; and then follows an analysis of symptoms made from thirty-one cases, the only ones to be found which could be considered reliable and regarded as cases of acute atrophy. The account thus made out is not very satisfactory, but the fault is not so much with Dr. Frerichs, as with the insufficient means at his disposal. In these cases other organs were diseased. Atrophy is a general disease, and when one organ or tissue is conspicuously its seat, others are generally affected by it. So we get symptoms from the failure of several organs to discharge their functions, and we cannot yet assign to each its part in the symptoms. Thus we are told of premonitory symptoms in half of the cases consisting of those derangements which

"are met with in acute catarrh of the stomach and bowels, occasionally of rheumatic affections; upon these symptoms jaundice supervened, which in its characters was in no way distinguishable from simple jaundice. In most cases the duration of these premonitory symptoms amounted to from three to five days, but in many cases to from two to three weeks and upwards."

Certainly, in these symptoms there is nothing diagnostic. The skin was invariably jaundiced, its temperature elevated only during the premonitory febrile stage, and afterwards for a short period in the stage of great nervous excitement. It is the seat of hemorrhages, as are various parts of the body.

"The heart's action presents great variations, and in connection only with oscillations in the heart's action, are there abnormal respiratory motions, and does the breathing become sighing or stertorous."

The organs of digestion always undergo important functional changes, abdominal pains being among the most important symptoms; changes in the volume of the liver and spleen, and repeated vomiting, obstinate constipation being also noticeable.

"There are remarkable variations in the composition of the urine, indicating the existence of deeply important, although long unrecognized abnormal states of the metamorphosis of matter, and they furnish (provided further observations shall, as I have no doubt, show them to be of constant occurrence) no small insight into the transformations which take place in the albuminous principles in cases where the functions of the liver are arrested."

Here we may ask, are these symptoms from the kidneys due to a deficiency in their nutrition from the assimilating functions of the liver being suspended, or from the causes of disease of the liver acting on the kidneys and interfering with the functions of these organs? Abnormal conditions of the nervous system have been observed in every case as essential and characteristic symptoms. Thus the especial dependence of the nervous system on the liver is clearly manifested. From whatever cause its functions are interfered with, the nervous system suffers. A healthy blood is neces-

sary to the proper performance of its functions. If the kidneys do not excrete the urea we have headache, convulsions, coma, and other symptoms; and, if the liver does not perform its functions we may have the same symptoms. Can we distinguish between failures of these two organs by variations in these symptoms. In many cases they coexist. The causes which affect assimilation, as the poisons giving rise to the various fevers, act on both organs. Do not the causes which affect nutrition sometimes act on both, and under what circumstances is their influence limited to one? We do not find an answer to this question. We speak of Bright's disease of the kidney. We mean by this term modifications of circulation (that is, if we consider albuminous urine and dropsy, as diagnostic symptoms of the disease) as well as atrophy, granular degeneration, fatty degeneration, and the exudations of inflammation. Now we have no such one term for disease of the liver, embracing such diverse anatomical conditions of that organ. Dr. Frerichs begins with atrophy of the liver, and then goes on with fatty degeneration, pigmentary degeneration, cirrhosis, hyperæmia, and inflammation. But may not atrophy be a result of inflammation, or of fatty, or of fibrous degeneration? In these cases of acute atrophy he speaks of the glandular epithelium of the kidneys as being in most cases in a state of fatty degeneration, but he does not tell us whether in these same cases a similar degeneration had been found in the liver. There is an article on the nature of the disease, in which our author says that he hesitates to identify the destruction of the hepatic cells with fatty degeneration, whilst he is disposed to regard an exudation process as the starting point of the disease. Rokitansky, Henoch, Von Dusch refer the destruction of the hepatic cells to the action of the bile. Now, when the gall ducts are obstructed, distended, and pressure is made on the cells by retained excretion, a destructive agency is exerted, as in cases of retention of urine, when the secretory tissue of the kidneys disappears. But, an excess of elements of the bile formed in the blood of the portal vein, pervading the vascular apparatus of the liver and causing destruction of the glandular tissue by liquefaction, or an infiltration of the liver with bile from paralysis of bile ducts and lymphatic vessels, are simply theories, destitute of proof as is well shown by Frerichs.

In discussing the question, How are the symptoms which accompany the disease connected with the structural changes? our author again declares his belief of the harmlessness of the constituents of the bile, that is, in the slight importance of the excrementitious function of the liver. He dwells particularly on the

"cessation of the powerful influence which the liver exerts over the processes of metamorphosis of matter, and alludes to the formation of sugar out of albuminous substances, as a necessary link in the functional processes of the gland, and he infers from the existence of numerous other substances which have been observed, partly under normal, and partly under pathological conditions, such substances as xanthine, urea, inosite, leucine, tyrosine, cystine, that the organ is intimately related in many ways to the metamorphosis of matter."

He thus continues the discussion:—

"The important nature of these relations is shown by the remarkable changes which the urine—the general recipient of the chief ultimate products of this metamorphosis—undergoes in acute atrophy of the liver. The urea, which is the normal product of the disintegrated albuminous tissues, as we have seen, gradually disappears, and in its place a large quantity of products which are foreign to healthy urine, make their appearance. Its solid constituents consist almost exclusively of leucine and tyrosine, together with a peculiar extractive

matter: uric acid is present in tolerable quantity. It is doubtful what is the cause of the absence of urea. Is this substance really formed, although not excreted by the kidneys, or is the metamorphosis of tissue so far altered that at last no urea comes to be formed as an ultimate product? The considerable quantity of urea which is found in the blood, proves that its elimination is really stopped: still we must not conclude from this that the formation of the product takes place in a normal manner, because we have no idea, not even an approximate one, as regards the amount to which it accumulates in the blood. Thus far it must be regarded as an established fact, that acute atrophy of the liver induces very important abnormal conditions of the metamorphosis of matter, and that during its progress substances circulate in the blood which are not met with in that fluid in a healthy condition. What it is which induces the symptoms of blood poisoning is uncertain: that it is not leucine or tyrosine, is proved by injection of these substances into the blood of animals, producing no derangements of the nervous functions. It is more probable that they are due to a retention of the constituents of the urine, but this point cannot be determined without further investigation."

The reader can become convinced by a perusal of this passage, how our author, in following up one function of the liver, its part in the metamorphosis of tissue, loses sight of its excretion. The service rendered to science by Dr. Austin Flint, Jr., in his study of cholesterine, is as apparant.

Chronic atrophy of the liver is the subject of the sixth chapter; and the fatty liver that of the seventh. We are told that

"Deposits of fat in the tissue of the liver are amongst the most frequent structural changes observed in the organ. When this deposit attains to a high degree, we are wont to regard it as a disease, and to designate it by the name of fatty liver.

"All attempts to sketch an accurate history of this anatomical lesion, from clinical observations, have proved unsuccessful; fatty liver is met with so frequently on opening the dead body, and all clues to diagnosis during life are so inaccessible, that it is impossible to construct a satisfactory history of the affection. The remark, bearing upon this point, which Louis made, many years ago, in his *Recherches sur la Phthisie*, is, in many respects, still applicable: 'Nous manquons de signes capables de le faire connaitre à une époque quelconque de sa durée. En vain j'ai été au devant des symptômes, qui pourraient lui appartenir, je n'en ai recueilli aucun."

Our author sets before us the normal function of the liver in the production of fat, exemplified especially in invertebrate animals and in fish, and then studies the agency of diet to modify the amount of fat of the organ. He tells us that

"It is not merely food that is unusually rich in fat that gives rise to these deposits in the liver, but, under certain circumstances, every kind of food when in too great quantity has the same effect even when it is free from fat and only contains a large quantity of the carbohydrogens. Here, however, the deposit does not make its appearance in the liver until the other organs and tissues are loaded with fat."

There is an interesting tabular view of the occurrence of fatty deposit in the liver, in different diseases, determined by microscopic examination, in which we find that the hepatic cells were rich in oil in 164 out of 466 bodies, whilst in one of sixteen bodies the fatty deposit pervaded the cells as far as the centre of the lobules. Tubercle of the lungs and the drunkard's dyscrasia are the pathological conditions in which fatty degeneration is most frequent; constitutional syphilis in eight cases was accompanied by a more or less fatty liver. It is very infrequent in caries, but was repeatedly observed in typhus, variola, and pyæmia, as well as in cirrhosis. It is noticeable that the smallest quantity of fat in the liver occurred in diabetes.

There are many interesting questions in connection with fatty liver brought before us in this treatise: What influence is exercised by the organ in the production or modification of fat; what is the pathological importance of fatty liver; what are the effects of the deposited fat upon the function of the liver and upon the entire system; what are the symptoms of fatty liver? None of these questions can be fully answered, but light is thrown upon all of them. A general conclusion is drawn

"That in every instance in which the blood becomes loaded with fat, either as a consequence of improper diet, or owing to abnormal conditions of the metamorphosis of matter, infiltration of the liver with fat may be developed either in transient or permanent form. There are two sets of glands, particularly, which become implicated by this altered condition of the blood, viz., the liver and the sebaceous glands of the skin. A greasy or velvety character of the cutis is thus a frequent accompaniment of fatty liver, and may, under certain circumstances, be of service in diagnosis."

Fatty infiltration is distinguished from fatty degeneration. This last is connected with atrophy, with imperfect nutrition, and here the liver is a sufferer in common with other organs. In the treatment of fatty liver we must regulate the diet, fat and alcoholic drinks to be avoided, and we must exhibit such drugs as may act to increase the secretion and the flow of the bile.

As the affection is found under different circumstances and in connection with several other diseases, no uniform plan can be laid down. We are told that the treatment must be mainly preventive and symptomatic.

The heading of the eighth chapter is "The Pigment Liver; Melanæmic Liver; Alterations in the Liver resulting from intermittent fevers." In the first article devoted to an historical account, we are reminded of the earliest theories of humoral pathology. In the discussions on its nature, origin, and effects, the origin of the pigment was supposed to be elsewhere, but a black viscid blood was said to be furnished to the liver to stagnate there, to become acrid, and, being distributed to other parts of the system, to give rise to most serious derangements, to fevers, convulsions, paralysis, and delirium. Towards the end of the last century Reid attacked these views. Heusinger attributed the morbid condition to a deposit of black pigment, and accounted for it by an exaggerated venous condition of the blood. Still, marsh fevers were regarded as atrabiliary fevers, and, then, when the causes of these fevers were shown to be from a poison in the atmosphere called malaria, the exact origin and composition of which is still unknown, the effects of that poison being principally on the spleen, and the agency of this organ as pigmentary, and in the red blood corpuscles being acknowledged, this whole subject was reviewed, and we are now trying to find out the seat, causes, and effect of what the ancients called atrabile. Black livers are found, and in the same cases black pigmentary deposits have been made in other organs. Bailly, in his account of the pernicious intermittents of Rome, dwells on the dark colour of the cortical substance of the brain. Bright speaks of a brain of the colour of black lead.

Now fever poison acts on the nervous system, presiding over the circulation of the blood, produces hyperæmia of the glands, and in this way at any rate acts on the blood. Enlargement, softening of the spleen, are anatomical characteristics of typhoid as well as of periodical fevers. Hyperæmia of the liver, modifications of its colour and size are especially associated with the last diseases, and are, to a certain extent, diagnostic of them. The mesenteric glands, Peyer's patches, undergo changes in typhoid fever. In disease of the supra-renal capsules, we find pigmentary degenerations,

as well as anæmia, which is so marked an effect of periodical fever. The colouring matter of the blood is modified, but by what organs? We must acknowledge several organs as concerned in blood making. The colouring matter of the urine and of the bile comes from the blood; then the kidneys and the liver have something to do with the colour of the blood. All admit now that disorder of the liver is not the only source of its black colour, but exactly what part the spleen acts in this process we do not know.

The article by Frerichs, containing an anatomical description of the pigment liver and of the co-existing conditions of the spleen, brain, kidneys and heart, is followed by one on the "Plan and Mode of Origin of Pigment," and by another on the "Results produced by the Formation of Pigment upon the Structure and Functions of the various Organs." There are thirteen observations in this chapter. In ten of these cases periodical fever was also present. In the article on etiology we are told that we do not know why this pigmentary degeneration, so associated with intermittent fever, is more frequently met with in certain epidemics. In the treatment, the cure of the periodical fever is spoken of as the first thing. To neutralize, to get rid of the poison is the first object. Our attention is called to its effects on the kidneys—

"Which become diseased in such a manner as to excite apprehension, sometimes at an early date, at other times not until a later period. Albuminuria and hematuria, which accompany the fever paroxysm, and remit and intermit along with it, yield best to quinine, and disappear, for the most part, so soon as the fever ceases."

The great danger in convalescence consisting in derangement of nutrition of the liver from its capillaries being loaded with pigment, and from the antecedent congestion conjoined with the alteration in the composition of the blood, produced by the poison, numerous capillaries being destroyed, and then a gradually increasing atrophy of the gland, which is not to be averted by any treatment known to Dr. Frerichs.

The ninth and last chapter of the first volume is on hyperæmia and its consequences. An account is given of the causes of the circulation in the liver, and of the modifying agencies of adjoining organs, and of the dependence of the circulation on nervous influences. Hemorrhage from the liver, with apoplexy and softening, are treated of in a sort of appendix. This chapter is a short one, and there is not room within our limits for very especial remark. Here, as elsewhere, we recognize how much is being done for, and how much is still wanting in our knowledge of the workings of this organ in health and disease. In tropical countries where its disorders prevail, practitioners and patients seem intimately acquainted with its functions, and the mode and causes of their interruption. The word bilious is in frequent use, and applied under various circumstances, and we are supposed to have several specifics for the relief and cure of those who are said to be in that condition. But when we ask of science a definition of this term, and an explanation of what is included in it, we must read a great deal, and then find out how much yet remains to be discovered. It is comparatively easy to guess at truth, but to get hold of it and put it into scientific formulæ is a most difficult matter.

The second volume of Dr. Frerichs' treatise opens with a chapter on inflammation of the liver. The author tells us that—

"By the term 'inflammation of the liver,' the ancient physicians designated certain groups of functional derangements, with the anatomical origin of which they were but imperfectly acquainted. Hence an indefinite idea was attached

to the term, which comprehended many diseases that did not properly belong to it. Of the earlier observations, those only can with certainty be relied on which proved to be really instances of inflammation, by terminating in the formation of abscess; cases of this nature were long ago described by Hippocrates, and his description was accompanied by some very apposite observations on diagnosis and prognosis. Galen distinguished between phlegmon and erysipelas of the liver, and, in addition to inflammation, described a hot and a cold 'intemperies.' Bianchi designated this intemperies by the term hepatitis, and made phlegmon and erysipelas of the liver distinct from it. In this way many writers fell into the error of making artificial subdivisions, for which no real foundations existed in nature. It was not until the 17th century, when pathological anatomy began to be studied, that a firm foundation was afforded for the clinical observation of these affections; but still, for a long period, physicians applied the term hepatitis to a group of symptoms which, in many instances, did not arise from inflammation of the liver; and, even at the present day, practitioners employ the term inflammation of the liver far more frequently than is warranted by the circumstances of the case."

In this account of a false symptomatology without a proper connection with anatomy and physiology, we recognize the advance made in medical science by the cultivation of pathological anatomy, and by the prevalence of a sounder philosophy, according to which, our powers of observation are employed to ascertain and describe the structure of different parts and organs, to watch them in operation, whilst faculties of arrangement and reasoning are subservient to place the various details in their proper relations. And yet our pathology is still so imperfect that great deficiencies, actual and relative, are at once apparent, when, from our foundation of anatomy and physiology, we try to build up the structure of symptomatology and therapeutics. The ancients failed signally in liver pathology from ignorance of anatomy and physiology; but when we would start with our greatly improved knowledge of structure and function, to give an account of one, and that a most important diseased process, of the inflammation of the organ, we find our progress slow, and we must admit that what we know is far less than what our predecessors of a thousand years ago confidently asserted and maintained. A chapter of one hundred and sixty-six pages is devoted by Mr. Frerichs to inflammation of the liver. His nosology is anatomical. Inflammation of the capsule of the liver, perihepatitis, is discussed in four pages. A comparison is sometimes instituted between our knowledge of the lungs and the liver. What author could undertake to tell all that is known of pleurisy in four octavo pages? We are told that these inflammatory processes are rarely accompanied by serious derangements, and it is only in exceptional cases that they lead to dangerous results. The causes are more frequently disease of the liver itself, or of adjacent parts or organs.

"The chief symptoms by which the disease may be recognized are the following. First, there is tenderness of the hepatic region upon pressure, upon motion, and upon deep inspiration, without any change in the volume or situation of the organ. Jaundice as a rule, is absent, or is slight, and of short duration. In addition, there are the symptoms of the primary disease, simple ulcer or cancer of the stomach, right pleurisy, &c. Febrile excitement of the vascular system is not unfrequently present. When the portal vein, the hepatic veins, or the bile ducts become implicated, the symptoms of disease of the vessels of the liver, or of chronic atrophy, or of obstruction of bile, manifest themselves."

The treatment is given in seven lines, in which bleeding, calomel, neutral salts, rigid diet, and rest are recommended.

Two forms of hepatitis are described, a diffuse inflammation, and a

circumscribed, followed by an abscess. Four cases of the first are given; the anatomical peculiarities are dwelt on at some little length, but no especial article is assigned to the symptoms or treatment, and we are referred to observations made in the first volume. What a difference between what is to be said of acute pneumonia and of acute hepatitis!

Chronic diffuse inflammation of the liver, to which the term cirrhosis is applied, occupies the next seventy-five pages. We have an historical account in which we are told of Morgagni and Baillie, as having recognized this state, at the same time confounding it with other lesions; and of Laennec as the first to apply the term; of the opinions of Bouillaud, and Andral, and Becquerel, whilst an accurate knowledge of the lesion was first obtained through the investigations of Kiernan, Hallmann, and Carswell. Allusion is made to the views of Rokitanski, Gubler, Budd, and Henock; and then there follows quite an elaborate anatomical description. We are reminded how infrequent are the opportunities of tracing the development of induration of the liver during life, or of examining, anatomically, the early stages of the lesion. Hence a difficulty of connecting symptoms with lesions, as well as of treating the successive stages of lesions. We recognize cirrhosis as a sequel of inflammation, hyperæmia, fibrinous exudation, hypertrophy of the connective tissue, as connected with atrophy of the secreting and circulating tissue. Pathologists are not agreed as to what should be called cirrhosis. Inflammation, hypertrophy of connective tissue, atrophy of secreting tissue are the leading features with Frerichs. He has also a separate article for simple induration of the liver, where granulations are not found at the autopsy, but

"Here a dense mass of areolar tissue becomes substituted for the parenchyma of the liver, from which, in many cases, every trace of the glandular tissue has disappeared over large spaces, whilst at other parts brown uniformly distributed dots of the remnants of the secreting cells can still be distinguished."

A diagnosis during life between simple and granular induration is possible only when careful palpation can be practised. The symptoms of the two affections agree. Rokitansky speaks of two forms of cirrhosis, the one proceeding from a morbid development of the capillary bloodvessels, owing to an excessive secretion of bile, the other due to chronic inflammation of the parenchyma. Partial impermeability of the finest ramifications of the portal vein, resulting from inflammation and obliteration, or from lateral compression by the bile ducts, which are enlarged and loaded with fat; such are the anatomical features prominent with Oppolzer. Frerichs admits that the liver becomes granular in hyperæmia, from obstructed circulation in cardiac and pulmonary disease, but he does not agree with Becquerel in calling this cirrhosis, nor does he find disease of the heart and lungs frequent concomitant lesions. It seems to us that no one can say exactly what cirrhosis is anatomically. Inflammation and exudation, modifications of veins, arteries, and ducts are recognized by all authors who are not agreed as to the sequence, or relative prominence of these lesions. The name is anatomical, from appearances rather than from the nature of the lesion. Science has got beyond it, yet we cannot dispense with it. We still want histories of fibrous exudation, of fatty and amyloid degenerations of hypertrophy and atrophy. Attempts at all these are made, but with very partial success. We talk of drunkards' liver, of syphilitic liver. We recognize that also alcohol and syphilis are poisons determined to the liver, influencing its nutrition; but apparently with different effects in

different cases. Frerichs speaks of alcohol as the prominent cause in cirrhosis.

"Of 36 cases of cirrhosis which have come under my observation, twelve of the patients confessed to having been in the habit of drinking brandy in excess, and several of the others were suspected of the same vicious habit." "I have met with cirrhosis and delirium tremens far more frequently at Kiel, where strong spirits are frequently drunk in excess, than at Göttingen and Breslau, where the use of beer or wine is more common." "The rapid absorption of the spirits into the portal vein must give rise to irritation of the liver."

Now, all writers agree in making the liver the prominent organ to suffer in those addicted to the inordinate use of alcoholic drinks. But no explanation can be given. If alcohol does not undergo a change in the system, but is removed from it after it has acted in the venous system and passed through certain emunctories, we cannot suppose that the liver suffers in efforts to expel it. It is taken up by the veins, passed through the liver to the lungs, and thus gets out of the system. The lungs, the excretory organ, do not seem to suffer, but the liver is the seat of the mischief. New wines and beer containing starch and sugar, substances in the assimilation of which the liver has its function, do not as much mischief as malt spirits. This is Budd's observation, and Frerichs confirms it. Then we are told that—

"Whether there are other acrid ingesta, besides alcohol, which by being transmitted in the portal blood through the liver, can irritate this organ in such a manner as to give rise to chronic inflammation with subsequent induration, is a question which has not yet received a satisfactory answer. Budd is inclined to ascribe the frequent occurrence of cirrhosis, in India, to the excessive use of curry and other irritating spices, and there can be no doubt that these and similar substances, such as strong coffee, may excite transient hyperæmias of the liver."

The two prominent blood-making, assimilating, excreting glands—the liver and the lungs—are so related that we cannot take up any point in the pathology of the one without corresponding points in the history of the other occurring to the mind. Cold is said to be the principal cause of inflammation and degeneration of the lungs. Yet this cause is not applied directly to the organ. A healthy man, in active exercise on a cold day, draws cold air into his lungs with impunity. Another, breathing a warmer air, but with cool air applied to the skin, as in a damp, cool atmosphere in which the skin does not readily perform its excreting function, and in which its circulation is not free, has an attack of pneumonia, the exciting cause being a poison in the blood, something that the skin readily excretes, but which is removed by the lungs only with much irritation, with hyperæmia, exudation, and breaking down of tissue. There are atmospherical poisons, telluric poisons acting on the lungs. Bronchial typhus is a disease produced by an animal poison derived from without, an effect of contagion. Now we should expect poisons to be the principal causes of inflammation of the liver. The expression "taking cold," is not as often applied here as it is in affection of the lungs. The effete matter of the body which is still in the blood from defective circulation and excretion of the skin, does not seem to be determined to the liver, the diseases of which organ are most frequent in hot climates. But in these climates there are telluric and atmospherical poisons acting on the nervous system presiding over the circulation and secretion of the liver, and we hear of bilious fevers and of yellow fever. The organ suffers too in some way directly from overwork. Those going from England to India, and continuing the ingestion of alcoholic

drinks, which they had considered wholesome at home, suffer. Is this because the lungs, the excreting organs of alcohol, are less active, and hence alcohol stays longer in its passage through the liver, and has more chance to do mischief? There is less muscular exercise, the circulation is less active in these organs, they do not waste as fast, call less for the material of assimilation, and perhaps in this way the liver may suffer, being supplied with a blood from which the elaborated material has not been removed. The kidneys and the liver seem to be intimately connected. Both suffer from the poison of alcohol. We find bile pigment, leucine, and tyrosine in the urine, when the bile ducts are obstructed. In what way does the liver suffer when the kidneys are deficient? The fact that many causes interfere with the circulation and secretion of both the organs is a reason of our imperfect acquaintance with the symptoms of the diseases of each of them. We speak of syphilis as the cause of disease of the liver. This poison affects also the skin and the mucous membranes; it is in the blood. Like alcohol, it is generally a slow poison, and an opportunity of inspecting the internal organs is only afforded after many years of disease, and it is very seldom that the patient has been all the time under the observation of one practitioner. Our author describes three different forms of syphilitic hepatitis: the first, simple interstitial hepatitis and perihepatitis; the second, hepatitis gummosa; and the third, waxy, amyloid, or lardaceous degeneration.

The second chapter of the volume is devoted to this last affection, which was described by Stahl and Boerhaave, and referred to an accumulation of altered, thickened, or corrupted blood. To Rokitanski is given the credit of being the first to give a clear account of the essential character of this degeneration, and to recognize aright its pathogenetic relations to certain cachexiæ. Our author admits that investigations into the nature of this degeneration are not satisfactory. It is found in the spleen, lymphatic glands, kidneys, bloodvessels, mucous membranes, cartilage, and nerve tissue. It is found in connection with tubercle of the lungs and intestines, with caries and necrosis in scrofulous subjects. Malaria is one of its causes. But, here, in anatomy and etiology, we know more than in symptomatology. Other organs and tissues are so frequently affected, other diseases and disorders are so frequently found in connection with it, that the distinctive marks of the affection of the liver are not well ascertained. The secreting tissue, the apparatus for circulation, is sometimes more and sometimes less injured in the exudations of inflammations, in fatty and amyloid degeneration, and in cancer. When we have detected one of these degenerations as existing in the economy, then we may ask to what extent is the liver its seat. The illustrative cases of these diseases given by our author are well worth perusal, as well as his anatomical descriptions. Foundations are being laid, but the time has not yet come for valuable results in therapeutics. We are learning of the causes of these vicious diseases, and thus know how to advise those predisposed to them. But to detect them and recognize them positively, in their first stages, or to arrest the processes when well advanced, is not yet within our power. In his remarks on abscess of the liver, a limited and comparatively simple affection, our author admits that whilst

"In some cases there are definite symptoms directing attention to the seat of the disease from the beginning; these local symptoms are often so ill defined, or so obscured by others, the manifold varieties which they present are so difficult of analysis, essential symptoms and non-essential, are so easily confounded, that in a very large number of instances, the diagnosis does not rest upon that in-

fallible basis upon which we are enabled to build our conclusions in the case of diseases of other organs."

The third chapter, on hypertrophy, is a very short one. We are referred to the chapter on relative cases and forms, and we are told that—

"The question is still involved in much obscurity, and must be cleared up by subsequent investigation."

The fourth chapter is on pathological new formations, hepatic tumours, some of which are but of slight importance in medical practice, there being scarcely any constitutional symptoms, and their diagnosis being impossible. Hydatids are fully treated with interesting illustrations, and more than eighty pages are devoted to cancer. In one-fourth of the cases analyzed by our author, the disease was primary; and in three-fourths of the cases which were secondary, the site of the primary disease was on some organ of the portal system in two-thirds.

"No particular abnormal conditions are known to predispose to the development of cancer of the liver. The disease is met with in the anæmic as well as in the plethoric; in the badly fed as well as in those who live luxuriously. Neither spirituous liquors nor climate are predisposing causes, nor is it certain that any important influence can be attributed to hereditary transmission. The termination is always fatal; no one has succeeded in proving beyond doubt a single instance of cure. The treatment can only be directed against symptoms."

There is a short article on emphysema hepatis, in the concluding sentence of which we are told—

"Whether emphysema of the liver may, as Louis and Piorry believe that they have proved, exist during life, and be diagnosed from the disappearance of the hepatic dulness, can only be satisfactorily determined by further observations."

The fifth chapter is taken up with diseases of the bloodvessels. Congestion or hyperæmia was regarded as the cause of many symptoms attributed to a failure of the liver in performing its functions, and this congestion was supposed to be from disease of the vessels. But we now recognize the nervous system as paralyzed or unduly stimulated resulting in a failure of the circulation, and a subsequent failure of secretion. Frerichs speaks of the modern tendency to attribute all morbid processes to an anatomical origin being carried too far. He gives a list of twenty-seven authors who have written on obstruction of the portal vein and adhesive pylephlebitis; eight have written on calcification of the portal vein, six on rupture of the portal vein, and twenty-nine on purulent inflammation of the same vessel. He treats in separate articles diseases of the hepatic artery, of the portal vein, and of the hepatic veins. Many diseases or modifications of the arteries are in connection with or subsequent to diseases of the parenchyma, hypertrophy, atrophy, morbid growths. We are told that—

"The symptoms to which aneurism of the hepatic artery gives rise, are accordingly of a three-fold nature. In the first place, there is the tumour, which is sometimes remarkably large, and displaces the liver; secondly, there is the neuralgic pain produced by pressure upon the hepatic plexus of nerves; and, lastly, there is jaundice caused by compression of the bile ducts. The fatal termination, in most cases, takes place under symptoms of internal hemorrhage. It is very easy to mistake such a case for the colic arising from gall stones."

The diseases of the portal vein are enumerated by our author as coagula of blood and inflammation, thrombosis and pylephlebitis; obstruction. We are told that inflammation of the portal vein constitutes the starting-point in a comparatively small number of the cases where it is found. An analysis

of twenty-eight observations of obstruction of the portal vein in reference to the symptoms, has yielded the following results: ascites was absent in only three cases.

"In a man who died of very profuse hemorrhage from the stomach and bowels, I failed to observe either ascites or enlargement of the spleen, notwithstanding the complete occlusion of the trunk and branches of the portal vein. Here the hemorrhage compensated for the serous transudation which would, otherwise, have resulted from the obstruction. Diarrhœa was present in all but three cases, and in one-third of them the evacuations were bloody. In only four cases was there bloody vomiting."

Suppurative inflammation of the portal vein is especially interesting in reference to the metastatic abscesses which were once described as the effects of phlebitis. Our author regards it as almost invariably a consecutive lesion resulting from suppurative processes in the organs, in which the roots of the portal vein originate, or through which the vessel takes its course. Ulcerations of the intestinal canal and stomach constitute the most frequent starting-point of the disease, eight of twenty-five cases originating in this way. Ulceration of the cæcum and appendix vermiformis, in connection with the retention of hard fecal matter or with that of foreign bodies, is frequently a starting-point. Abscesses of the spleen sometimes give rise to suppurative pylephlebitis, and there are several cases on record associated with suppuration in the mesentery and mesenteric glands. Inflammatory irritation of the bile ducts may lead to ulceration and perforation not only of the wall of the bile ducts, but also of the vein.

"The most important data for diagnosis are the following: Pains in the epigastrium above the umbilicus or in the right hypochondrium, or in any of the other localities in which the inflammation has been shown to originate; attacks of rigors, occurring at regular intervals, and followed by profuse sweats; painful enlargement of the liver and spleen, accompanied by jaundice, bilious diarrhœa, and rapid emaciation; and lastly the typhoid symptoms of blood-poisoning, and the symptoms of general peritonitis."

Thus we see that repeated rigors, followed by heat and sweat, as in other cases of pyæmia, are prominent and characteristic symptoms. Of twenty-five cases, the formation of metastatic deposits in other parts of the body took place in only four, the portions of thrombus propelled into the circulation being arrested in the capillaries of the liver. The rapid loss of flesh and strength at an early period are also noticeable, as well as the delirium, somnolence, "the typhoid derangements of the nervous system" coming on later. In thrombus of the portal vein the violent fever with typhoid symptoms is wanting, and in place of peritonitis we find ascites. We are told also that treatment is powerless against suppurative inflammation of the portal vein, and that the disease always terminates in death, recovery being possible only when single branches of the vein are affected.

Adhesive and suppurative inflammation are likewise observed in the hepatic veins, but the diagnosis between obliteration of the hepatic veins and obstruction of the portal vein is impossible. The treatment must be regulated by the same principles as in adhesive pylephlebitis. Suppurative inflammation of the hepatic veins is more common, and is usually the result of hepatic abscesses. The hepatic veins, having no sheath, are more liable to these affections than the portal veins. Purulent phlebitis of the hepatic veins is more frequently accompanied by metastatic deposits in other organs than is the same affection of the portal veins.

Reference is again made to the dilatation of the capillary roots of the

hepatic veins coming on in the course of valvular disease of the heart, and attaining such a degree that the glandular cells in the centre of the lobules disappear, and there is a granular atrophy which our author cautions against confounding with cirrhosis. But we must not linger, and can only notice briefly the sixth and last chapter of the volume, devoted to diseases of the biliary passages.

Inflammation of the biliary passages is described as catarrhal and exudative. Our author tells us that these diseases of the biliary passages have not been sufficiently studied. Bronchitis, or inflammation of the excretory duct of the lung, is a well-known and frequent disease, of which cough and expectoration and rales are symptoms easily appreciated and recognized. The air, varying so much in temperature, and so frequently charged with foreign bodies, containing such different degrees of aqueous vapour, is a ready means of exciting diseased processes. Various poisons contained in the air disturb the circulation and secretion of the lining membrane of these ducts, as influenza and typhus, and their effects are soon detected. Death soon follows upon occlusion or marked obstruction of this duct, and we have opportunities of inspecting the parts after acute diseases and before other organs have undergone morbid alterations, the disorders of which would very much complicate the case. Three causes of catarrhal inflammation of the biliary passages are specified by our author, the most frequent of which is the existence of catarrh of the stomach and duodenum. He tells us that in forty-one cases, premonitory symptoms of gastro-enteric catarrh were discovered in thirty-four, and he seems to think that poisons contained in the atmosphere, as those which give rise to periodical and yellow fevers, act on the liver to disturb its functions by first inducing hyperæmia and inflammation of adjacent organs. Diseases of the parenchyma of the liver, hyperæmia, inflammation, degeneration, give rise to catarrh of the ducts. Now, in all these cases, symptoms from the disease and disorder of the stomach, duodenum, and parenchyma, are the early and prominent ones. The yellow skin and urine tell of the liver being affected, and these may be produced by an obstruction of the ducts from inflammation, thickening, exudation of the lining membrane, or from the secreting cells being acted on, their structure being modified, or the supply of blood or nerve-power failing them. We seem to have no symptoms purely referable to catarrh of the ducts. We explain in this way many cases of jaundice, because we infer that such may be the case, but we can hardly have direct proof that it is so. We do not find evidence of hepatitis, of cirrhosis, of cancer, or other hepatic degenerations, and the temporary and mild symptoms lead us to some state which can supervene and disappear in a short time. It is thus that diagnosis of catarrh of the bile ducts is often arrived at. The third cause of catarrh is the presence of foreign bodies, as concretions, worms, and these affections give rise to symptoms which overshadow those from catarrh. Bilious colic, the passage of a gall-stone, gives rise to catarrh, but it is marked by symptoms which engross the attention, and requires a treatment with but little reference to the catarrh.

The remedies used by our author in the treatment of catarrhal inflammation are rhubarb with carbonate of soda, aloes, colocynth, lemon-juice, bitartrate of potash, nitre, muriatic acid, and the mineral waters of Karlsbad, Marienbad, and Kissingen. Several vegetable extracts, as those of dandelion, celandine, and thistle, are also recommended.

Exudative inflammation of the gall-bladder and ducts, giving rise to pure fibrinous products or to purulent matter abounding in albumen, occurs

in the course of typhus and typhoid fevers, of cholera and pyæmia, as well as in cases of occlusion of the ducts by concretions in them, or by tumours pressing on them. A case from Andral is given where an error in diet was followed by duodenitis, the inflammation extending to the ductus choledochus, which was swollen so as to cause obstruction, its softened coats gave way under the pressure, and death supervened from peritonitis. In a case observed by our author, with the inflammation and ulceration of the mucous membrane of the biliary passages, there was an abscess in the liver of the size of a child's head, perforation of a smaller abscess and peritonitis. Pleurisy, pneumonia, bronchitis, were also present. Great debility, pains of head and abdomen, constipation, moderate cough, mucous expectoration, a moderate febrile movement, were the symptoms when the patient was first observed four weeks after giving up work, a decided rigor ushering in the symptoms; somnolence preceded death, a tinge of yellow was noticed in the skin first at the autopsy. Certainly in this case there were no definite symptoms of exudative inflammation of the biliary passages, and our author tells us we must not expect them until occlusion has taken place so as to interfere with the passage of bile. Our anatomical knowledge goes far before symptomatology here as elsewhere.

An article on constriction and occlusion of the biliary passages is followed by one on their dilatation, which is said to be almost without exception, the consequence of stricture. Dilatation of the gall-bladder is the subject of the next article, and a remarkable case communicated by Dr. Pepper, to this journal, is introduced. In the diagnosis of this affection we are told that

"every semi-globular or pear-shaped tumour that is felt at the margin of the liver must not at once be put down as an enlarged gall-bladder. Echinococci, abscesses of the liver, cancerous tumours of the liver and gall-bladder, may give rise to similar prominences."

Hydatid tumours may present the form of the gall-bladder, and soft medullary cancers sometimes grow from the lower margin of the gland.

In the article on morbid growths of the biliary passages, we are told that cancer may be primary, and that simple cancer of the gall-bladder is most frequent in old persons, commencing in the submucous tissue.

Foreign bodies in the biliary passages are the subject of the sixth article, the first three sections of which are devoted to entozoa, ascarides, hydatids, and distoma. Thirty-seven instances of round worms in the biliary passages are said to be all that are recorded in medical literature. In several of these cases death was attributable to their presence; colic and convulsions being prominent symptoms. Jaundice and white stools characterized other cases, whilst, sometimes, there were no symptoms referable to the liver.

The distomata are said to have their habitat in the biliary passages of the ruminantia, and are rarely found in the human body.

In the cases of the human subject the diagnosis of distomata could only be arrived at when they were ejected by vomiting or with the stools. Their etiology is still obscure. They probably enter the intestinal canal as cercariæ. In sheep jaundice rarely shows itself, and then only lasts a short time; a condition of anæmia being ultimately developed.

The subject of gall-stones occupies the last section in this article, and seventy octavo pages are devoted to it. First, we have an historical account, and, then the chemical and physical characters are given at some length. Mode of origin, disintegration, and etiology are successively brought forward. We are told that "cholesterine" is very rarely absent, and usually

forms the principal constituent of biliary concretions, colouring matter being found in all of them, but with few exceptions, there being several forms partly free and partly united with calcareous matter. Small quantities of biliary acids, in combination with a base, are found in most gall-stones, fatty acids and soaps, mucus and epithelium, oxides of iron, manganese, and copper, carbonates of lime and magnesia, earthy carbonates, phosphates and sulphates being other ingredients. The three parts of compound calculi, the nucleus, the shell, and the crust, are separately described; and then follows the article on their mode of origin. Stagnation and decomposition of bile constitute the primary cause of the formation, all the various ingredients of these concretions, except epithelium and mucus, being contained in a state of solution in normal bile. Still, our knowledge of. the formation of these bodies is admitted to be very defective in many particulars.

"The diagnosis of gall-stones is easy or difficult, according to the severity of the derangements that they excite in the liver and its excretory apparatus."

We sometimes find gall-stones in the evacuations, when their existence has not been suspected, whilst the clinical features of hepatic colic cannot be confounded with those of any other affection.

But the practical question of treatment—how is that answered? Here too our knowledge is imperfect. We give one more extract, that our readers may have the views of our author on an important point, in his own words.

"The conditions under which a solution of a concretion is brought about, vary according to the nature of the external crust. Cholesterine and the compound of cholepyrrhin and lime, which are its most important constituents, and likewise, the mucus and cholate of lime may be dissolved by very alkaline bile; but this will produce no change upon a crust composed of carbonate of lime. Moreover, bile of a thin watery character may loosen the stones, dissolve their connective material, and so lead to their mechanical destruction or comminution. Hence the reason is intelligible why Hoffman's idea of employing alkalies in the treatment of gall-stones has again come to prevail, more particularly in the form of the alkaline mineral waters, which, as is shown by experience, produce a copious secretion of bile.

"These mineral waters" [of Karlsbad, Vichy, Ems, Marienbad, Eger] "have certainly proved the most efficacious remedies against gall-stones. In many cases I have directed my patients to go to Karlsbad, and have known them to return cured. In other cases I have known favourable results ensue under my own eyes, from drinking the water brought from the mill spring of Karlsbad, either cold or warm. French physicians speak in similar terms of Vichy water."

"The result, however, must not be mainly referred to the solvent power of these springs. The concretions are not dissolved to any great extent; most of them are voided unchanged under all the symptoms of hepatic colic; they are propelled by the current of the bile, the quantity of which is increased. It is a question for the medical men at Karlsbad and Vichy to determine more accurately than has hitherto been done, in what form gall-stones are voided under the use of those springs, whether unchanged, or eroded, or comminuted.

"If we have to choose from among the mineral waters above mentioned, Karlsbad and Vichy stand pre-eminent as the most efficacious; the former is to be preferred where there is not obstinate constipation. Ems is to be recommended to very irritable debilitated patients, suffering from a tendency to diarrhœa; Marienbad to plethoric patients with a disposition to congestions. The bicarbonate of soda, by itself, in combination with the sulphate of soda, is less efficacious than the mineral waters, being more apt to derange digestion, and ought to be given very diluted."

Bidder and Schmidt say that an increased ingestion of water is followed by an augmented secretion of thin bile, and Vanotti believes that he cured a case of gall-stones by the simple drinking of large quantities of water.

Hepatic neuralgia, independently of gall-stones, is believed in by our author, and an illustrative case given. In the appendix we have a description of gall-stones in twelve cases, and in a second article experiments on the excretion of hippuric acid by Dr. Neukomm.

We have thus endeavoured to give some account of the treatise by Dr. Frerichs. The importance of the subject and the fact of the work not having been republished in this country, are reasons for the extended notice. There are so many matters of interest in both volumes, so much that is still imperfectly explained and understood, that it has not been easy to confine ourselves to the present limits. There are ample opportunities in our country for studying these diseases, and they have not been neglected. We must go on in our efforts to ascertain more definitely how the liver performs its several functions. We hope that Dr. Flint will go on with his experiments and observations on its excreting office. Its functions in nutrition, in blood making, in the formation of sugar and fat, need to be more accurately defined and described, and we must still ask how does it contribute to sustain animal heat. It is certainly remarkable that an agent which has had a reputation for so long a time for powers of modifying and increasing the secretion of the organ, should now be on trial, and the question asked, after all has it any efficacy? Dr. Inman, of Liverpool, is maintaining that there is evidence that mercury does not increase the hepatic secretion, and Dr. Thudicum tells us of Dr. Mosler's proving that mercury does not make its appearance in the bile when given in the form of calomel, and of conclusions from several experiments, that the chances are six to one that calomel will diminish the quantity of bile secreted. "So move we on." Two hundred years ago the pathology of the liver was given with great assurance and certainty; its therapeutics were not doubted; but, now, a clinical treatise in two volumes, published successively in the course of two years, can only be regarded as a contribution, and views taken in it must be modified to meet researches which have been made and published since the work was undertaken. High praise should be awarded to it, and we shall look forward with interest to the subsequent researches of the author, as well as to those of others who without the means of, and incentives to exploration and study possessed by him, are living in countries and climates where the diseases and disorders of the organ are much more rife, and who thus have still greater opportunities of clinical observation.

Dr. Frerichs has given us a good clinical treatise on diseases of the liver. It must be carefully read by all who would have a distinct idea of what is and what is not known of the matters there treated, by all who would study the subject for themselves. Many of the questions arising in the mind of the practising physician are not satisfactorily answered even there; but ways are pointed out in which knowledge has been obtained, and in which more is to be had. We recognize how various are the functions of the organ, and we acknowledge how difficult it is of exploration, and how much less easily the fluid manufactured by it can be got hold of for analysis than that coming from the kidneys. Still, so much has been done in spite of all obstacles—so much skill, perseverance, and love of truth have been shown by various experimenters and observers, that we must be hopeful for the future, and believe that our present works on diseases of the liver will ere long be superseded, although they will not lose their place in the annals of science, and will be remembered as identified with stages in a continual progress towards a goal which is still far off, and may never be reached.

G. C. S.

ART. XV.—*Origin, Antiquity, and Zoological Relations of Man.*

1. *The Geological Evidences of the Antiquity of Man, with remarks on Theories of the Origin of Species by Variation.* By Sir CHARLES LYELL, F. R. S., etc. etc. Illustrated by wood-cuts. George W. Childs: Philadelphia, 1863. 8vo. pp. 518.
2. *Pre-historic Man. Researches into the Origin of Civilization in the Old and the New World.* By DANIEL WILSON, LL. D., Professor of History and English Literature in University College, Toronto, etc. Macmillan & Co.: London, 1862. 2 vols. 8vo. pp. 488 and 499.
3. *Evidence as to Man's Place in Nature.* By THOMAS HENRY HUXLEY. London and Edinburgh, 1863. 8vo. pp. 159.
4. *Ethnology and Phrenology, as an aid to the Historian.* By J. W. JACKSON. Trübner & Co.: London, 1863. 8vo. pp. 324.
5. *The Races of the Old World: a Manual of Ethnology.* By CHARLES L. BRACE. Charles Scribner: New York, 1863. 8vo. pp. 540.
6. *Pre-Adamite Man: The Story of the Human Race, from* 35,000 *to* 100,000 *years ago.* By GRIFFIN LEE, of Texas. Sinclair Tousey: New York, 1863. 8vo. pp. 408.
7. *A History of the Intellectual Development of Europe.* By JOHN WILLIAM DRAPER, M. D., LL. D., Professor of Chemistry and Physiology in the University of New York, etc. etc. Harper & Brother: New York, 1863. 8vo. pp. 631.
8. *Antiquités Celtiques et Antédiluviennes. Mémoire sur l'Industrie primitive et les Arts à leur Origine.* Par M. BOUCHER DE PERTHES. Treuttel et Wurtz: Paris, Tome 1, 8vo. pp. 628. Avec 80 planches représentant 1600 figures; Tome 2, 8vo. pp. 511. Avec 26 planches représentant 500 figures.
9. *Anthropologie der Naturvölker.* Von Dr. THEODOR WAITZ, Professor der Philosophie zu Marburg. Erster Theil: Ueber die Einheit des Menschengeschlechtes und den Naturzustand des Menschen. 8vo. pp. 487. Zweiter Theil: Die Negervölker und ihre Verwandten. Mit einer Karte und sieben Abbildungen. 8vo. pp. 524. Friedrich Fleischer: Leipzig, 1859, 1860.
10. *The Anthropological Review and Journal of the Anthropological Society of London*; No. 1. London, 1863. 8vo. pp. 192.
11. *Bulletins de la Société d'Anthropologie de Paris,* t. 1 et 2. Victor Masson et Fils: Paris, 1860, 1861. 8vo. pp. 576 and 710.
12. *Mémoirs de la Société d'Anthropologie de Paris.* T. 1. Fascic. 1, 2 et 3. Paris, 1861.

PROFESSOR AGASSIZ has somewhere said "that whenever a new and startling fact is brought to light in science, people first say, 'it is not true,' then that 'it is contrary to religion,' and lastly, 'that every body knew it before.'" A somewhat similar idea finds expression in the characteristic language with which Dr. Knox, that bold adventurer in ethnology, prefaces his remarkable work on the *Races of Men.* "As to the hack compilers," he says, "their course is simple; they will first deny the doctrine to be true; when this becomes clearly untenable, they will deny that it is new; and they will finish by engrossing the whole in their next compilations, omitting carefully the name of the author."

These statements are the embodiment of the melancholy fact—unhappily too well known to the pioneers of knowledge—that every science secures for itself recognition and a place in the circle of the sciences, only after the most severe and prolonged struggle with ignorance, incredulity, and dogmatic prejudice. It was thus with chemistry, astronomy, palæontology, geology, etc.; and it is now so eminently true of ethnology as to have won for this, the youngest of the sciences, the expressive title—" la science militante."

The history of ethnology, as thus far developed, is the record of three great controversies concerning—1st. The unity or plurality of origin of man. 2d. The date of his advent upon earth; and, 3d. His exact position in the zoological scale. In some form or another, now in this place and then in that, the discussion of these profoundly complicated problems has been carried on with varying and indefinite results for many years past. Formerly the theologian occupied the field of dispute to the exclusion of all others. Now, however, the zoologist, the geologist, the philologist, and the antiquarian have entered the arena, in full armor, each willing to do battle for the truth against all comers; while the world of science and of letters looks on, with constantly deepening interest, and brimful of expectation as to the important truths which will sooner or later be elicited by the conflict. Under the stalwart blows of the combatants ethnology is gradually taking a definite shape. New accessions are daily made to its storehouse of facts, and these, duly arranged and classified, are having their true value assigned to them.

With the object of acquainting our readers with the present status of ethnology we purpose, in the following pages, to give a brief account of recent inquiries as to the origin and antiquity of man, and the place which he occupies in nature.

I. More than two hundred years have elapsed since the much vexed question of the original unity or diversity of man was first agitated. It is a curious fact that the earliest and for a long time the only attempt to bring the unity doctrine into disrepute, was made not by the naturalist, but by a bold and restless theologian—one Peyrerius[1]—whose daring, scholastic essay upon the Pre-Adamites,[2] published in 1655, aroused the indignation of both Protestant and Catholic clergy, and was, by command of the Sorbonne, publicly burned in the Place de Grève by the common hangman. From that day to the present, this acrimonious discussion, originating thus in the domain of the theologian, and at first debated entirely upon theological grounds, as may be seen by referring to some of the replies to Peyrerius' work,[3] has gradually grown stronger and stronger until its vehemence has caused the whole science of ethnology to assume a somewhat offensive and suspicious attitude in the eyes of many people. The fact that Voltaire, D'Hancarville and other deistical writers took an early part in the controversy, was not without its prejudicial effect upon the popular mind. Vol-

[1] Isaac Peregre was a Calvinist scholar of Bordeaux. The Inquisition compelled him to abjure both his Calvinism and his Pre-Adamite heresy. He died in a convent in 1676.

[2] Præ-Adamitæ, sive exercitatio super versibus XIImo., XIIImo., et XIVto capitis quinti Epistolæ D. Pauli ad Romanos. Quibus inducuntur primi homines ante Adamum conditi. Anno Salutis MDCLV.

[3] See among others that curious work entitled, Non-ens Præ-Adamiticum. Sive confutatio vani et Socinizantis cujusdam Somini, etc. Autore Antonio Hulsio, Lugd. Batav. MDCLVI.

taire ridiculed the unity doctrine unmercifully; D'Hancarville, on the contrary, though equally heterodox as Voltaire, supported this dogma in positive terms.

At length Linnæus, in the 12th edition of his famous *Systema Naturæ*,[1] by recognizing two species of the genus Homo—H. sapiens and H. troglodytes—espoused, in a measure, the plurality doctrine, and made the first decided attempt to shift the whole controversy from grounds purely theological to others more scientific and more within the compass of the methods of research familiar to zoologists. Linnæus was followed in this direction by Virey, Desmoulins, Bory de St. Vincent, Jacquinot, Hombron, Dumoutier, Blanchard, Berard, Morton, Agassiz, Knox, Caldwell, Hamilton Smith, Burke, Van Amringe, Maury, Lucas, Broc, Giebel, Klemm, Zeune, Remusat, Pouchét, and many others. All these writers, basing their arguments upon scientific facts, have more or less positively proclaimed their belief in the plural origin of man. The unity doctrine, on the other hand, has been maintained, also upon zoological grounds chiefly, by Buffon, Zimmerman, Camper, Blumenbach, Georges Cuvier, John Hunter, Lesson, Lacepède, Griffith, Foster, Walckenaer, Haller, Weber, Tiedemann, Prichard, Pitta, Wagner, Bakker, Herder, Flourens, J. Müller, Serres, De Quatrefages, Humboldt, Carpenter, Hall, Owen, Draper, Godron, and others. The theological or Scriptural aspects of the question have been debated, with more or less acerbity, by Fabre d'Olivet, Rafinesque, Klee, Cardinal Wiseman, the Abbes Frère, Migne, Forichon and Maupied, and other transatlantic writers; and in this country, among others, by Nott, Gliddon, Bachman, Hamilton, Smyth, Cabell, Baldwin, Hodge, and Pendleton. The half-theological, half-scientific discussion in which these writers have taken part, may be regarded as having been inaugurated in 1774, when Lord Kaims published his well-known *Sketches of the History of Man*, in which he had the hardihood to advocate the doctrine of the original diversity of mankind. The heterodox conclusions of this writer, being regarded as an attack upon the verity of revealed religion, were criticized by the Rev. S. Stanhope Smith, in an appendix to a paper read before the American Philosophical Society, and first published in 1787.[2] This essay was in turn commented upon by Charles White, in a series of Discourses delivered before the Literary and Philosophical Society of Manchester.[3] Smith subsequently animadverted upon the remarks of White, and the controversy gradually spread to other writers of less note. At a later period (1847) Dr. Morton published an *Essay on Hybridity*. This was opposingly reviewed by the Rev. Dr. Bachman in the *Charleston Journal*. Morton replied, and very soon some of the points so hotly contested in the old Peyrerian debate were once more revived and discussed. In December, 1848, Dr. J. C. Nott, of Mobile, delivered from the chair of Political Economy of the University of Louisiana, *Two Lectures on the Biblical and Physical History of Man*. About the same time (July, 1850), Agassiz announced in the *Christian Examiner*, of Boston, his conviction that man was plural in origin. These publications called forth a reply from the Rev. Dr. Hamilton, in a work entitled *The Friend of Moses*. At this

[1] See also his Mantissa Plantarum Altera. Holmiæ, 1771.

[2] An Essay on the Causes of the Variety of Complexion and Figure in the Human Species, &c. By Samuel Stanhope Smith, D. D., LL. D., &c. 2d edition. New Brunswick, 1810.

[3] An Account of the Regular Gradation in Man, and in different Animals and Vegetables, &c. By Charles White. London, 1799.

time, also (1849—1851), the Rev. Dr. Thos. Smyth, by lectures and a series of papers contributed to different religious serials, and afterwards collected and published in one volume, endeavoured to prove that the unity of the human races was the doctrine of Scripture, reason, and science. The discussion became very animated, and gradually assumed not a little of the bitterness so characteristic of religious controversy. In 1854 appeared the *Types of Mankind*, a work in which, unhappily for ethnology, religion was again mixed up with science, and a determined and aggressive attack made upon the Mosaic account of the origin and early history of man, or rather, to speak more correctly, upon the generally received interpretation of that account. A series of articles, directed chiefly against Messrs. Agassiz, Nott, Gliddon, and Patterson, quickly appeared in the *Charleston Journal* from the pen of Dr. Bachman. Nott defended himself, and Luke Burke, of London, in his turn, attacked Bachman in a caustic review contributed to the pages of the *Charleston Journal*. At a later period, upon the publication of *Indigenous Races of the Earth*, the controversy was transferred to the pages of the *New Jersey Medical and Surgical Reporter*, and there carried on by other writers whose vehemence and misguided enthusiasm were, in most instances, equalled only by their profound ignorance not only of the facts but also of the practical objects and philosophical methods of ethnology.[1]

Within the last two years the ethnological controversy has again been transferred to Europe, in consequence of the publication, in 1858, of M. Pouchet's able work, entitled *De la Pluralité des Races Humaines*. An unfavourable report upon this work was presented to the Academy of Sciences, Belles-Lettres and Arts of Rouen, by M. de Saint-Philbert, who commented severely upon the opinions advanced by M. Pouchet, and pronounced them to be materialistic in their tendency and subversive of all religious faith. To this report M. Pouchet replied in a sharply-written letter, dated May 20, 1859, and entitled *Science et Religion*, and here the controversy, in this direction, rests for the present.

II. Closely connected with the vexed question of mankind's origin, so long and so violently debated, is that of the antiquity of man, a subject which is attracting, at the present time, an unusual degree of attention, owing more especially to the discovery of flint implements and other traces of human art in the diluvial formation both of France and England.

This discovery was first made at Abbeville, in France, by M. Boucher de Perthes,[2] who, after communicating the results of his labours, commenced as long ago as 1826,[3] to the Imperial Society of Emulation at Abbeville, published an elaborate work on the subject, entitled *Antiquités Celtiques*

[1] In proof of this, see, among other articles, an extraordinary "Critique on Nott and Gliddon's Ethnological Works." By Abraham Coles, M. D. Reprinted from the Reporter for September, 1857.

[2] We are aware that 70 years ago, John Frere, F. S. A., discovered in the parish of Hoxne, in the county of Suffolk, England, some flints which he exhibited to the Antiquarian Society, observing that he thought they belonged to a very remote period, even beyond that of the present world, and that the spot in which they were found was probably the place of their manufacture, and not of their accidental deposit. No notice, however, appears to have been taken of his discovery.

[3] As far back as 1805, M. de Perthes visited the Roland grotto, near Marseilles, and in 1810 the Grotto de Palo in the Papal dominions, and detected among some animal bones certain flints, with the yellow tint of which he was struck as being analogous to that exhibited by certain beds of the diluvians. He was led by this circumstance to seek these stones in their natural position. A favourable oppor-

*et Antédiluviennes*, the first volume of which appeared in 1849, and the second in 1857. In that work the author contended that his discoveries positively proved the extreme antiquity of man, and his opinions, though for a long time treated with indifference and incredulity, at length found some support in the researches of M. Aymard, a distinguished palæontologist and antiquary, who discovered, some years ago, in the volcanic district of Central France, the skulls, teeth, and some of the bones of two human skeletons imbedded in a volcanic breccia found in the mountain of Denise, in the environs of Le Puy-en-Velay, a breccia anterior in date to one, at least, of the latest eruptions of the volcanic mountain.[1] Subsequently the stratified gravel in the neighbourhood of Abbeville and Amiens, and the quarries of St. Acheul and St. Roch, were explored by Mr. Joseph Prestwich, Sir Charles Lyell, Dr. Rigollot,[2] and Messrs. Buteux, Pictet, Scrope, Hébert, Lartet, Austen, Flower, Mylne, Falconer, Evans, and Pouchet.[3] Mr. Prestwich also explored the diluvium at Hoxne in Suffolk, England, established its perfect analogy with that at Abbeville, and found therein similar fossil bones and flint axes.[4] All these gentlemen, with the exception of Mr. Scrope, incline more or less strongly to the belief that these flints and the fossil remains found with them indicate a higher antiquity for man than is usually acknowledged. Sir Charles Lyell, indeed, in his Address before the meeting of the British Association held at Aberdeen, in 1859, went so far as to say, and this assertion he reiterates in the work under notice, that "scepticism in regard to the cave-evidence in favour of the antiquity of man has hitherto been pushed to the extreme," that man was probably old enough to have coexisted with the Siberian mammoth, that the antiquity of the Abbeville and Amiens flint instruments is great indeed if compared to the times of history and tradition, and that a vast lapse of ages appears to have separated the era in which the fossil implements were formed, and that of the invasion of Gaul by the Romans.

At the same meeting the Rev. Dr. Anderson opposed the ascription of a high antiquity to man, and in this country the Rev. Dr. Pendleton, of Lexington, Virginia, has quite lately taken up the subject in a spirit more of criticism than of original research. This gentleman assails Lyell actively, and insinuates that the accustomed scientific caution of the eminent geologist has forsaken him, that he is inconsistent and self-contradictory, and that the change in his former belief concerning the age of mankind is due, not to the discovery of the flint axes of Abbeville and Amiens alone, but also, in part, to the disposition which he manifests to receive and indorse

tunity at length presented itself in consequence of the successive exposure of numerous beds of the diluvium upon which the valley of the Somme reposes, caused by the extensive works undertaken for the fortification of Abbeville, the digging of a canal, and the preparations for the railroads between 1830 and 1840.

[1] "On the opposite side of the mountain beds of tufa, apparently contemporaneous with those in which human bones have been found, are certain remains of the diluvian fauna, specially of the mammoth. These facts seem to indicate that man lived in Auvergne at a remote period, when the volcanoes were in a state of activity, and the extinct diluvian fauna still existed." (Pictet, *Biblioth. Univ. de Genève*, 1860.)

[2] Mémoire sur les Instruments en Silex trouvés à St. Acheul, près d'Amiens, et considérés sous les rapports géologique et Archeologique, Amiens, 1854.

[3] Excursion aux Carrières de St. Acheul. Extrait des Actes du Muséum d'Histoire Naturelle de Rouen, 1860. See also for much interesting information the voluminous "Notes et Correspondance" at the end of the 2d volume of Boucher de Perthes' work.

[4] See an extract from the Proceedings of the Imperial Society of Emulation at Abbeville. Séance of June 23, 1859, published in L'Abbevillois for July 7, 1859.

the recent work of Darwin on the *Origin of Species*, a work which Dr. Pendleton regards as "skilful and able," it is true, but also as "discredited alike by the requirements of inductive philosophy, by the established laws of evidence, by the moral instincts, the individual aspirations and the social interests of mankind, and by all the sacred realities of religion," and the final conclusions of which he thinks exhibit the "blackness of atheism," unrelieved by a single ray of light.[1] And yet the fundamental principle of continuous descent with modification through natural selection, so ably advocated in this "wonderful work," as it has justly been called,[2] is, in many respects, calculated, better than any other theory perhaps, to remove certain weighty objections which still oppose the scientific acceptance of the doctrine of man's original unity, for the facts and arguments brought forward by Darwin go very far, as he interprets them, towards reconciling the morphological doctrine of unity of type amidst endless diversity of form, with the teleological notion of the conditions of existence.

The results of the systematic investigation which was made in 1858 of the Brixham cave, near Torquay, in Devonshire, led to a re-examination in England and on the Continent of the numerous facts previously brought forward in support of the opinion, that man coexisted in ancient times with certain species of mammalia long since extinct. As new cases bearing on the same question, whether relating to caves or to alluvial strata in valleys, were constantly occurring, Sir Charles Lyell, in order to qualify himself for their appreciation and discussion, visited, in the course of the last three years, many parts of England, France, and Belgium, and communicated, personally or by letter, with many of the English and foreign geologists who have taken part in these researches.

The results of these deeply interesting inquiries are embodied in the work under notice, for an exact and elegant reprint of which, beautifully illustrated, we are indebted to the intelligent enterprise and liberality of Mr. Childs. A description is also given of the glacial formations of Europe and North America, with the object of considering the probable relations of these in a chronological point of view to the human epoch, and why, throughout a great part of the northern hemisphere, they so often interpose an abrupt barrier to all attempts to trace further back into the past the signs of the existence of man upon the earth. In the concluding chapters of his work, the distinguished author discusses briefly the recent modifications of the Lamarckian theory of progressive development and transmutation, which are suggested by the recent work of Darwin on the *Origin of Species, by Variation and Natural Selection*, and the bearing of this hypothesis on the different races of mankind, and their connection with other parts of the animal kingdom.

It will thus be seen that the work divides itself into three parts; the first of which contains an excellent resumé of all thus far known of the pre-historic traces of man; the second gives us an account of the glacial period; while the third is devoted to an elaborate discussion of the claims of the Darwinian theory. To use the words of the *Saturday Review*, the "work is a trilogy, the constituent elements of which should be headed, respectively, Pre-historic Man, Ice, and Darwin."[3]

With a view to the better understanding of the geological aspect of the

[1] Science a Witness for the Bible. By Rev. W. N. Pendleton, D. D., Philadelphia, 1860. Discussion IV., on the Age of Mankind.

[2] See British and Foreign Medico-Chirurgical Review for April, 1860. Review V.

[3] See Natural History Review, April, 1863, p. 212.

question of human antiquity, an abridged general table of fossiliferous strata is given in the first chapter, together with some remarks upon the relations of these strata and their nomenclature.

In the second chapter a concise account is given of the various evidences of man's existence during the formation of the "recent" or upper post-pliocene deposits of the post-tertiary strata. These evidences consist of works of art found in the Danish peat, in the Danish shell-mounds, or kjökkenmödding, in certain ancient Swiss lake-dwellings, built on piles, and in similar Irish lake-dwellings, or crannoges. The rude industrial implements collected in these different localities have been carefully studied by MM. Nillson, Steenstrup, Forchhammer, Thomsen, Worsäae, and other celebrated Danish and Swedish antiquaries and naturalists, who have by this means established for Scandinavian man a chronological succession of periods designated as the ages of stone, of bronze, and of iron, according to the material of which the instruments were constructed.

The Danish peat-deposits vary in thickness from ten to thirty feet, the lower stratum consisting chiefly of moss or sphagnum supporting another growth of peat not composed exclusively of aquatic or swamp plants. Throughout these deposits the prostrate trunks of trees are imbedded at various depths. In the lowest part are found the trunks of the Scotch fir, a tree evidently indigenous in the human period, but no longer extant in the Danish islands. At higher levels are found numerous trunks of the common oak, which appears to have supplanted the fir. Still higher occurs the pedunculated variety of the same oak, along with the alder, birch, and hazel. The common beech now takes the place of the oak in Denmark. The white birch appears in the lower part of the bogs, and disappears from the upper, while the aspen occurs at all levels, and still flourishes in Denmark. The land and fresh-water shells and the mammalian remains, like those of the plants hitherto discovered in these peat beds, are of recent species.

"The age of stone in Denmark coincided with the period of the first vegetation, or that of the Scotch fir, and in part at least with the second vegetation, or that of the oak. But a considerable portion of the oak epoch coincided with 'the age of bronze,' for swords and shields of that metal, now in the Museum of Copenhagen, have been taken out of peat in which oaks abound. The age of iron corresponded more nearly with that of the beech-tree.[1]

"It has been suggested that an age of copper must always have intervened between that of stone and bronze; but, if so, the interval seems to have been short in Europe, owing apparently to the territory occupied by the aboriginal inhabitants having been invaded and conquered by a people coming from the East, to whom the use of swords, spears, and other weapons of bronze was familiar. Hatchets, however, of copper have been found in the Danish peat."

The Kjökkenmödding, or "kitchen-refuse-heaps," are mounds found along the shores of all the Danish islands, and composed of shells of oysters, cockles, and other mollusks, intermingled with the bones of various quadrupeds, birds, and fish which once served as the food of the rude hunters and fishers by whom the mounds were accumulated. These mounds are from 3 to 10 feet high, from 150 to 200 feet wide, and in some places 1000 feet long.

"Scattered all through these heaps are flint knives, hatchets, and other instruments of stone, horn, wood, and bone, with fragments of coarse pottery,

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[1] Morlot, Bulletin de la Société Vaudoise des Sci. Nat., t. vi. p. 292. The reader will find a translation of M. Morlot's instructive paper in the Smithsonian Report for 1860.

mixed with charcoal and cinders, but never any implements of bronze, still less of iron. The stone hatchets and knives had been sharpened by rubbing, and, in this respect, are one degree less rude than those of an older date, associated in France with the bones of extinct mammalia. These shell-mounds correspond in date to the older portion of the peaty record, or to the earliest part of the age of stone as known in Denmark."

During the past ten years the lakes of Switzerland and Great Britain have also furnished to the zealous antiquarian and naturalist information relative to the chronology of the human family. At the bottom of many Swiss lakes, in places where the water is from five to fifteen feet deep, ancient wooden piles have been discovered, in some instances projecting above the surface of the mud, and in others worn down to the level of it. There is ample evidence that these piles once supported villages long since crumbled into decay, and some of which were undoubtedly built during the age of stone, as may be inferred from the fact that numerous implements resembling those of the Danish shell-mounds and peat-mosses have been rescued from the mud surrounding the piles.[1]

With regard to the antiquity of the evidences of man's existence found in these different localities, Sir Charles Lyell thus writes:—

"What may be the antiquity of the earliest human remains preserved in the Danish peat cannot be estimated in centuries with any approach to accuracy. In the first place, in going back to the bronze age, we already find ourselves beyond the reach of history or even of tradition. In the time of the Romans the Danish Isles were covered, as now, with magnificent beech forests. Nowhere in the world does this tree flourish more luxuriantly than in Denmark, and eighteen centuries seem to have done little or nothing towards modifying the character of the forest vegetation. Yet in the antecedent bronze period there were no beech trees, or at most but a few stragglers, the country being then covered with oak. In the age of stone, again, the Scotch fir prevailed, and already there were human inhabitants in those old pine forests. How many generations of each species of tree flourished in succession before the pine was supplanted by the oak, and the oak by the beech, can be but vaguely conjectured, but the minimum of time required for the formation of so much peat must, according to the estimate of Steenstrup and other good authorities, have amounted to at least 4,000 years; and there is nothing in the observed rate of the growth of peat opposed to the conclusion that the number of centuries may not have been four times as great, even though the signs of man's existence have not yet been traced down to the lowest or amorphous stratum."

"The attempts of the Swiss geologists and archæologists to estimate definitely in years the antiquity of the bronze and stone periods, although as yet confessedly imperfect, deserve notice, and appear to me to be full of promise. The most elaborate calculation is that made by M. Morlot, respecting the delta of the Tinière, a torrent which flows into the Lake of Geneva near Villeneuve. This small delta, to which the stream is annually making additions, is composed of gravel and sand. Its shape is that of a flattened cone, and its internal structure has of late been laid open to view in a railway-cutting one thousand feet long and thirty-two feet deep. The regularity of its structure throughout implies that it has been formed very gradually, and by the uniform action of the same causes. Three layers of vegetable soil, each of which must at one time have formed the surface of the cone, have been cut through at different depths. The first of these was traced over a surface of 15,000 square feet, having an average thickness of five inches, and being about four feet below the present surface of the cone. This upper layer belonged to the Roman period, and contained Roman tiles and a coin. The second layer, followed over a surface of

[1] For a full and deeply interesting account of these lacustrine villages, the reader is referred to the beautiful work of Frédéric Troyon, entitled "Habitations Lacustres des temps anciens et modernes, Lausanne, 1860." Portions of this work have been translated and published in the Smithsonian Report for 1861.

25,000 square feet, was six inches thick, and lay at a depth of ten feet. In it were found fragments of unvarnished pottery and a pair of tweezers in bronze, indicating the bronze epoch. The third layer, followed for 35,000 square feet, was six or seven inches thick, and nineteen feet deep. In it were fragments of rude pottery, pieces of charcoal, broken bones, and a human skeleton having a small, round, and very thick skull. M. Morlot, assuming the Roman period to represent an antiquity of from sixteen to eighteen centuries, assigns to the bronze age a date of between 3,000 and 4,000 years, and to the oldest layer, that of the stone period, an age of from 5,000 to 7,000 years.

"Another calculation has been made by M. Troyon to obtain the approximate date of the remains of an ancient settlement built on piles and preserved in a peat-bog at Chamblon, near Yverdun, on the Lake of Neufchatel. The site of the ancient Roman town of Eburodunum (Yverdon), once on the borders of the lake, and between which and the shore there now intervenes a zone of newly-gained dry land, 2,500 feet in breadth, shows the rate at which the bed of the lake has been filled up with river sediment in fifteen centuries. Assuming the lake to have retreated at the same rate before the Roman period, the pile-works of Chamblon, which are of the bronze period, must be at the least 3,300 years old.

"For the third calculation, communicated to me by M. Morlot, we are indebted to M. Victor Gilliéron, of Neuveville, on the Lake of Bienne. It relates to the age of a pile-dwelling, the mammalian bones of which are considered by M. Rütimeyer to indicate the earliest portion of the stone period of Switzerland, and to correspond in age with the settlement of Moosseedorf.

"The piles in question occur at the Pont de Thièle, between the lakes of Bienne and Neufchatel. The old convent of St. Jean, founded 750 years ago, and built originally on the margin of the Lake of Bienne, is now at a considerable distance from the shore, and affords a measure of the rate of the gain of land in seven centuries and a half. Assuming that a similar rate of the conversion of water into marshy land prevailed antecedently, we should require an addition of sixty centuries for the growth of the morass intervening between the convent and the aquatic dwelling of Pont de Thièle, in all 6,750 years."

These estimates, it will be observed, express not the probable age of man so much, as the *lowest* antiquity of certain events and movements indicative of his presence on earth. They are but rough approximations to the truth, and must be received cautiously. But what, we may ask, is the *greatest* antiquity which geological research has yet been able to assign with confidence to man? We have examined Sir Charles Lyell's work with great care in order to find some definite answer to this question. But nowhere does he reply to it in explicit terms. He, however, supplies us with some geological details which serve to carry back man's presence to a period startlingly remote.

If we understand him correctly, Sir Charles appears to think that the delta of the Mississippi is more available as a chronometer by which to measure the lapse of post-pliocene time than any means which have as yet been discovered or rendered available in Europe. In his *Travels in North America* he has shown that the deposits forming the delta and alluvial plain of the Mississippi consist of sedimentary matter, extending over an area of 30,000 square miles, and known in some parts to be several hundred feet deep. The time required for the formation of this delta he estimates to be "many tens of thousands of years, probably more than 100,000."

Buried under four cypress forests in this formation, a human skeleton was found some years ago, to which Dr. B. Dowler ascribes an antiquity of 57,000 years. In a more ancient alluvial deposit of the same formation near Natchez, and associated with bones of the mastodon and megalonyx, was discovered a human os innominatum, for which an age of many thou-

sand years has been claimed. As to the high antiquity of these bony remains of man, he thinks "it is allowable to suspend our judgment." But on the same page he continues :—

"If, however, I am asked whether I consider the Natchez loam, with land-shells and the bones of mastodon and megalonyx, to be more ancient than the alluvium of the Somme containing flint implements and the remains of the mammoth and hyena, I must declare that I do not. * * * * * *. If the relative ages of the Picardy and Natchez alluvium were to be decided on conchological data alone, the fluvio-marine beds of Abbeville might rank as a shade older than the loess of Natchez. * * * *. If I was right in calculating that the present delta of the Mississippi has required, as a minimum of time, more than one hundred thousand years for its growth, it would follow, if the claims of the Natchez man to have coexisted with the mastodon are admitted, that North America was peopled more than a thousand centuries ago by the human race. But, even were that true, we could not presume, reasoning from ascertained geological data, that the Natchez bone was anterior in date to the antique flint hatchets of St. Acheul."

From all this, it is evident that Sir Charles thinks that the primitive men who fashioned and used the flint implements of Abbeville must have lived at least 100,000 years ago!

But our author goes even further than this in that part of his work devoted to the consideration of the glacial period in its chronological relations to man :—

"In order to form a connected view of the most simple series of changes in physical geography which can possibly account for the phenomena of the glacial period, and the period of the establishment of the present provinces of animals and plants, the following geographical states of the British and adjoining areas may be enumerated.

"First, a continental period, towards the close of which the forest of Cromer flourished; when the land was at least 500 feet above its present level, perhaps much higher, and its extent probably greater than that given in the map.

"Secondly, a period of submergence, by which the land north of the Thames and Bristol Channel, and that of Ireland, was gradually reduced to such an archipelago as is pictured in map, Fig. 40; and finally to such a prevalence of sea as is seen in map, Fig. 39. This was the period of great submergence and of floating ice, when the Scandinavian flora, which occupied the lower grounds during the first continental period, may have obtained exclusive possession of the only lands not covered with perpetual snow.

"Thirdly, a second continental period when the bed of the glacial sea, with its marine shells and erratic blocks, was laid dry, and when the quantity of land equalled that of the first period."

"The first appearance of man, when, together with the mammoth and woolly rhinoceros, or with the *Elephas antiquus*, *Rhinoceros hemitœchus*, and *Hippopotamus major*, he ranged freely from all parts of the continent into the British area, belongs probably to a late portion of this second continental period.

"Fourthly, the next and last change comprised the breaking up of the land of the British area once more into numerous islands, ending in the present geographical condition of things."

"The time which it would require to bring about such changes of level, according to the average rate of $2\frac{1}{2}$ feet per century, however vast, will not be found to exceed that which would best explain the successive fluctuations in terrestrial temperature, the glaciation of solid rocks, the transportation of erratics above and below the sea-level, the height of arctic shells above the sea, and last, not least, the migration of the existing species of animals and plants into their actual stations, and the extinction of some conspicuous forms which flourished during the post-pliocene ages. When we duly consider all these changes which have taken place since the beginning of the glacial epoch, or since the forest of Cromer and the *Elephas meridionalis* flourished, we shall find that the

phenomena become more and more intelligible in proportion to the slowness of the rate of elevation and depression which we assume.

"The submergence of Wales to the extent of 1400 feet, as proved by glacial shells, would require 56,000 years, at the rate of 2½ feet per century; but taking Professor Ramsey's estimate of 800 feet more, that elevation being required for the deposition of some of the stratified drift, we must demand an additional period of 32,000 years, amounting in all to 88,000; and the same time would be required for the re-elevation of the tract to its present height. But if the land rose in the second continental period no more than 600 feet above the present level, this 600 feet would have taken another 26,000 years; the whole of the grand oscillation, comprising the submergence and re-emergence, having taken, in round numbers, 180,000 years for its completion; and this, even if there were no pause or stationary period, when the downward movement ceased, and before it was converted into an upward one."

From these calculations we derive some idea of the age of the post-pliocene period. But this does not express the extreme age of man. To obtain this we must add to the number 180,000, the age of the pliocene era, which is probably as great, if not, indeed, greater. For Sir Charles thinks that "we may anticipate the finding of man's remains on some future day in the pliocene period."

Beyond this he ventures no further.

"We cannot," he says, "expect to meet with human bones in the miocene formations, where all the species and nearly all the genera of mammalia belong to types widely differing from those now living."

To this a writer in a recent number of the *Natural History Review* replies:—

"If man constitutes a separate family of the primates—and still more so, if he represents a special order—then, according to all analogy, there must have been some representatives of the family in miocene times."

Professor Huxley observes:—

"That the first traces of the primordial stock whence man has proceeded, need no longer be sought by those who entertain any form of the doctrine of progressive development in the newest tertiaries, but that they may be looked for in an epoch more distant from the age of the Elephas primigenius than that is from us."

And again he says:—

"Where then must we look for primæval man? Was the oldest *Homo Sapiens* pliocene or miocene, or yet more ancient? In still older strata do the fossilized bones of an ape more anthropoid, or a man more pithecoid than any yet known, await the researches of some unborn palæontologist?

"Time will show. But in the meanwhile, if any form of the doctrine of progressive development is correct, we must extend by long epochs the most liberal estimate that has yet been made of the antiquity of man."

The most liberal estimate of man's antiquity which we have been able to find, is that hazarded by the late Dr. Morton, not long before his death, in 1851.

"I have no doubt," he wrote, "that man will yet be found in the fossil state as low down as the Eocene deposits, and that he walked the earth with the Megalonyx and Paleotherium. His not having been hitherto discovered in the older stratified rocks, is no proof that he will not be hereafter found in them. Ten years ago the monkey tribes were unknown and denied in the fossil state; but they have since been identified in the Himalaya Mountain, Brazil, and England."[1]

[1] Types of Mankind, p. 326.

In a paper read before the Ethnological Society, of London, April 14, 1863, the president, Mr. Crawfurd, stated his—

"Conviction that the evidence which of late years had been adduced, giving to the presence of man on the earth an antiquity far beyond the usual estimate of it, is satisfactorily established, and that there can now be no question that man was a contemporary of animals, such as lions, hyenas, elephants and rhinoceroses, extinct far beyond the reach of human record."

"From the moment," writes M. Littré, "when man fashioned the stones to make himself implements, to the time when we see him erect temples and pyramids, and inscribe his monuments with hieroglyphics, a vast period must have elapsed. When the Egyptian priests conversed with Plato, and gave themselves an existence of ten thousand years, present investigators do not consider it an idle boast."[1]

M. Alfred Maury, in the *Revue des Deux Mondes*, says:—

"All doubts raised by geologists as to the exactness of Boucher de Perthes' observations must vanish. Man has indeed left the proofs of his existence at a period the antiquity of which cannot yet be calculated, but which contradicts all historical induction."

"Of all discoveries," writes M. Lartet, "proving the high antiquity of the human species in the west of Europe, the worked flints collected by Boucher de Perthes are the most conclusive evidence."[2]

Prof. Albert Gaudry, of the Paris Museum of Natural History, the author of several works on Palæontology, was sent to Amiens and Abbeville, in August, 1859. In his Report to the Academy of Sciences, read October 3, he concludes that—

"1. Man was the contemporary of the Rhinoceros tichorhinus, Hippopotamus major, Elephas primigenius, Cervus somonensis, and other extinct animals.

"2. The bed called by geologists the diluvium has been formed, partly at least, after the appearance of man. The formation has doubtless been the result of the great cataclysm."

D'Archiac believes that—

"The human race which has fashioned the flints of the diluvium of Abbeville and Amiens, had taken possession of that country at the time the British Islands were yet connected with the continent, since the separation of these isles had only been effected after the formation of the diluvian banks where the implements are found. As the formation of these diluvian banks was one of the consequences of the last Alpine dislocations, the same human race must have existed before Central Europe had attained its actual orographic state. The apparition of man in the *Western regions of Europe* must therefore date from an epoch when the surface of that continent must have been considerably different from what it is now.

"We arrive inevitably at the conclusion, that the terrestrial population of our continent has passed through all the so-called critical phases of the long quaternary period so variously affected by geological phenomena. If the persistence of species and the continuation of habitat has been possible for animals of all kinds, it must have been equally possible for man their contemporary, placed in the same circumstances. Why should there have been a biological intermission as regards man only when it is demonstrated that there was none in the animal species."[3]

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[1] Revue des Deux Mondes, 1858.

[2] Extract from a note presented by M. E. Lartet to the Académie des Sciences, March 19, 1860, on the "Geological Antiquity of the Human Race in Western Europe." See also Comptes Rendus for April 19, 1860.

[3] Bulletin de la Soc. Geol., t. x.

In a letter addressed to a friend, M. Ed. Collomb thus expresses his opinion in reference to the antiquity of man:—

"The thesis I purpose sustaining is that of the existence of man prior to the existence of the old glaciers. In my view, man existed at the commencement of the quaternary period, and was the contemporary of the Elephas primigenius, the Rhinoceros tichorhinus, the Ursus spelæus, etc., and many other extinct species, which are only found in the deposits immediately preceding the tertiary series.

"The remains of human industry in the valleys of the Somme, Seine, etc., correspond with the inferior diluvium of the valley of the Rhine, a deposit which is much anterior to the ancient glaciers of the Vosges, as it is separated from them by the middle diluvium of the Rhine, or the red diluvium of the valley of the Seine."[1]

M. Gaudin, who has carefully studied the flora which existed at the period when the great mammals became extinct, concludes from his investigations that—

"The major portion of the vegetable population of our continent has traversed all the phases of the quaternary period, and that man could thus have existed as well as the vegetable world of our continent."[2]

In his address before the meeting of the British Association held at Oxford in 1860, Lord Wrottesly said:—

"Another independent proof of the great age of the gravel on the banks of the Somme, is derived from the large deposit of peat, the oldest portion of which belongs to times far beyond those of tradition; yet distinguished geologists are of opinion the growth of all the vegetable matter, and even the original scooping out of the hollows, are events long posterior in date to the gravel with flint implements, nay, posterior even to the formation of the layers of loam with fresh-water shells overlying the gravel."

"It becomes daily more probable," writes Agassiz, "that facts will force us, sooner or later, to admit that the creation of man lies far beyond any period yet assigned to it, and that a succession of human races, as of animals, have followed one another upon the earth."[3]

The above quotations (and others might readily be cited from the works of De Saulcy, Pouchet, Gosse, Murchison, Waitz, Broca, and others) are reproduced here because they show how marked is the present tendency of scientific research to push the origin of man back, very far back into the dim mysterious night of time.

Up to the time of the publication of Lyell's work, not a single human bone had been discovered in the alluvial sand and gravel of the Somme, although many hundred flint implements and many thousand knives had been collected from this locality.

"This dearth of the mortal remains of our species," writes Sir Charles, "holds true equally, as yet, in all other parts of Europe where the tool-bearing drift of the post-pliocene period has been investigated in valley deposits. Yet in these same formations there is no want of bones of mammalia belonging to extinct and living species. In the course of the last quarter of a century, thousands of them have been submitted to the examination of skilful osteologists, and they have been unable to detect among them one fragment of a human skeleton, not even a tooth. * * * * * That ere long, now that curiosity

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[1] "On the Existence of Man prior to the Apparition of the Ancient Glaciers." Bibliothèque Univ. de Genève, t. viii. 1860.

[2] "On the Contemporary Vegetation of Primitive Man." Letter by C. I. N. Gaudin to Prof. Alph de Candolle; Bibliothèque Univ., t. viii. 1860.

[3] The Tertiary Age and its characteristic mammals. Atlantic Monthly, Sept. 1863, p. 339.

has been so much excited on this subject, some human remains will be detected in the older alluvium of European valleys, I confidently expect."

A few days after reading the above paragraph we received two numbers of *L'Abbevillois*, a French newspaper published at Abbeville, tri-weekly. These numbers contain an account of the proceedings of the Imperial Society of Emulation of Abbeville, at the sitting held April 16th, 1863. At that meeting M. Boucher de Perthes, the president, announced to the Society that on the 28th of March last, he had discovered and extracted with his own hands from the bed of black, argillaceous sand composing the diluvial bank of Moulin-Quignon,[1] one-half of a human, fossil, lower jaw, containing a penultimate molar, and which at first sight appeared to him to exhibit some difference from the jaw of the present race of men.[2] This bony fragment was found at the depth of four mètres and fifty-two centimètres, in the deposit known as the "black seam flinty gravel," so-called from its bluish-black colour which is produced by the oxides of iron and manganese. This deposit immediately overlies the chalk, being separated from it by a thin layer of black mangano-ferruginous clayey matter. It is one of the oldest of the Somme Valley beds, and belongs to what Mr. Prestwich calls the "high level" series.

At the distance of a few centimètres, and also buried in the black earth, was found a flint hatchet, which was disengaged from the bank by M. Oswald Dimpre. Drs. Dubois and Hecquet and M. de Villepoix, members of the Society of Emulation, pronounced the fragmentary jaw to be undoubtedly fossil, and somewhat different in conformation from the jaw of recent man. On the 10th of April, Abbeville was visited by M. l'Abbe Bourgeois, Professor of Philosophy and Natural History in the College of Pont-le-Voie; on the 14th by Drs. Carpenter, Felix Garrigou, and Falconer, and on the 15th by M. de Quatrefages, of Paris. These gentlemen, after examining carefully the bank, concluded that it was an undisturbed deposit (*vierge ou non remanié*), and confirmed the above opinion concerning the maxillary fragment.

On the 15th of April, M. de Perthes discovered in a layer of yellow sand of the same bank, and at the depth of 3½ mètres from the surface, two osseous fragments which Falconer and Quatrefages immediately recognized as belonging to the tooth of a mammoth (Elephas primigenius).

In the early part of April M. de Perthes collected a quantity of bones in a gravel-pit at Menchecourt at the depth of 8 metres. Among these he discovered a fragment of a human jaw and six detached teeth, which Dr. Falconer considered to be fossil, and to approach more closely to that of existing man than the jaw discovered at Moulin-Quignon.

"On the 16th of April Dr. Carpenter communicated a short paper to the Royal Society, supporting the authenticity of the discovery of the jaw at Moulin-Quignon; and during the debate, Dr. Falconer, in the absence of Dr. Carpenter and himself, was unauthorizedly cited as entertaining the same opinion. On the 20th of April M. de Quatrefages communicated to the 'Academy of Sciences' a note by M. Boucher de Perthes, followed by descriptive remarks by himself, conveying the high authority of his opinion in favour of the jaw being a true fossil of geological antiquity. On the 18th of April Dr. Falconer, immediately after his return to London, commenced the deliberate scrutiny of

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[1] The bank of Moulin-Quignon is located upon a plateau overlooking the valley, and is thirty mètres above the level of the Somme and of the sea.

[2] A lithographic sketch of this jaw, illustrating a paper by Alfred Tylor, "On the discovery of supposed human remains in the tool-bearing drift of Moulin-Quignon," will be found in the first number of the London Anthropological Review.

the materials which he had brought with him from Abbeville, and on the 21st, in conjunction with, or aided by, Mr. John Evans, Mr. Prestwich, Mr. Busk, and Mr. Tomes, he arrived at results opposed to the authenticity alike of the 'detached molar' of the jaw, and of the flint *hâches*. That day, without the delay of a post, he communicated his suspicions to M. Lartet, requesting him to make them, and the grounds upon which they were founded, known to M. de Quatrefages. But the latter had already given in his affirmative memoir to the 'Institut' on the previous day (20th), followed on the 27th of April and 4th of May by successive notes in the same sense. On the 25th of April a letter by Dr. Falconer, written before he was aware of M. de Quatrefages' first communication appeared in the *Times*, questioning the authenticity of the 'jaw' and of the *hâches*. Men of science in France and England were thus suddenly placed at direct issue on a grave and important point of great general interest. But, happily, from the frankness and rapidity of the communications interchanged, there existed the most cordial relations, and the conviction of loyalty and good faith on both sides. The French *savants*, the more they went into the case were the more convinced of the soundness of their conclusions; while their English opponents, the more they weighed the evidence before them were the more strengthened in their doubts. As a wordy discussion would but have wasted time and must have been protracted, and as a personal conference held out the best prospect of a speedy settlement of the question, a '*réunion*' of men of science, to be held at Paris, was proposed by the French *savants*."[1]

In accordance with this proposition, an English deputation, composed of Drs. Falconer and Carpenter, and Prof. Busk, arrived at Paris on the 9th of May, and were joined by Mr. Prestwich the next day. The French members of the commission, thus assembled for the "trial of the jaw," were MM. de Quatrefages, Lartet, Delesse, and Desnoyers. These gentlemen were assisted by MM. L'Abbé Bourgeois, Gaudry and Alphonse Milne-Edwards. M. Milne-Edwards, the eminent zoologist and member of the Institute, presided over the conference. MM. Buteux, Daubrée, Delanoue, Dimpre, Hébert, de Vibraye, Garrigou, Vaillant, Bert, and Marcotte were also present at the conference. *Séances* were held at Paris on the 9th, 10th, and 11th of May, and on the 12th and 13th at Abbeville.

After much careful investigation and protracted discussion, the following conclusions were put to the vote by the President, in order to test the opinions of the different members present.

1. The jaw in question has not been introduced surreptitiously into the quarry of Moulin-Quignon. It existed previously in the situation in which it was found by M. Boucher de Perthes, on the 28th of March last. This conclusion was unanimously adopted.

2. Everything conduces to the idea that the *dépôt* of this jaw is contemporaneous with that of the flints and other materials which constitute the argilo-gravelly mass known as the "*couche noire*," and which rests directly upon the chalk. This conclusion was adopted by all the members present, except MM. Falconer and Busk, who reserved their opinion until more ample information was obtained.

This resolution, it will be seen, admits that the jaw is of the same age as the Moulin-Quignon gravels. But the age of these gravels is itself in dispute. Mr. Prestwich regards them as belonging to the "high level" series, or most ancient of the quaternary deposits of the Somme Valley. M. Elie de Beaumont, on the contrary, refers them to his "*dépôts meubles sur des pentes*," as superficial modern deposits of the age of the peat beds.[2]

3. The worked flints, in the form of hatchets, which were exhibited at

[1] See Natural History Review for July, 1863, p. 425.

[2] For a succinct account of M. de Beaumont's views, see Medical Times and Gazette for August 29th, 1863, p. 237.

the *réunion* as having been found about the same time in the lower part of the quarry of Moulin-Quignon, are nearly all authentic. All the members accepted this conclusion except Mr. Falconer, who withheld his opinion until more information was obtained.

4. There is no sufficient reason for doubting that the *dépôt* of the hewn flints is contemporaneous with that of the jaw found in the "black seam." All the members gave their assent to this conclusion except MM. Falconer and Busk, who reserved their opinion for the present.

According to this resolution, if we adopt the view of Mr. Prestwich, both the *hâches* and the jaw belong to the old quaternary period. If M. Elie de Beaumont's view be correct, they are both as modern as the Gallo-Roman period. In M. Hébert's opinion, they belong to an age between these two.

MM. Busk and Falconer have placed upon record the following written statements of their opinions concerning the antiquity of this famous jaw.

"Abbeville, May 13, 1863.

Mr. Busk desires to add, that although he is of opinion, judging from the *external* condition of the jaw, and from other considerations of a more circumstantial nature, that there is no longer reason to doubt that the jaw was found in the situation and under the conditions reported by M. Boucher de Perthes, nevertheless it appears to him that the *internal* condition of the bone is wholly irreconcilable with an antiquity equal to that assigned to the deposits in which it was found."

"Abbeville, May 13, 1863.

"I am of opinion that the finding of the human jaw at Moulin-Quignon is authentic; but that the characters which it presents, taken in connection with the conditions under which it lay, are inconsistent with said jaw being of any great antiquity. "H. Falconer."

In a work published in five volumes, at Paris in 1838, and entitled *De la Creation et Progression des Êtres*, M. de Perthes announced his belief that, sooner or later, traces of the existence of primeval man would be discovered. On page 5 of the second volume of his *Antiquités Celtiques*, he says:—

"I had for a long time foreseen the existence of this antediluvian race, and for many years anticipated the pleasure I should enjoy, when in these deposits, which geology has so often declared barren, and of an epoch anterior to man, I should at last discover the proofs of his existence, if not the fossil bones in the remains of his works."

In 1847 he declared his conviction that the worked flints, then so rare, and regarded with so much incredulity, would be found, in course of time, in many localities and in great numbers. The same statement he thought would prove true of human fossils, and, as we have seen above, he even ventured the opinion, that the bony remains of man, when found, would exhibit some differences in conformation from those of the present day. The discoveries above described, and events which are daily transpiring, certainly seem to lend confirmation to these prophetic announcements of the veteran archæologist.

III. We turn now, in the course of our rapid survey, to another phase of ethnological inquiry. Where stands man in the order of created things? What is his position, and what are the relations which he bears to the universe without and about him?

Every one, at all conversant with the scientific discussions of the day, knows that this question of questions for mankind, as Professor Huxley calls it, this problem which underlies all others, and is more deeply in-

teresting than any other, has lately become an important "bone of contention" between the distinguished anatomist just named and Professor Owen. Orally, at the meetings of the British Association, and also in print, these two gentlemen have carried on this discussion with great vigour. In his able and interesting work, now before us, Prof. Huxley presents us with a *résumé* of his views upon the subject-matter of this debate. This work is divided into three parts. The first treats of the natural history of the man-like apes; the second, of the relations of man to the lower animals; and the third, of some remains of fossil man.

A moment's reflection will suffice to show that the study of man's position in the animate world is to a great extent an inquiry simply into the anatomical and physiological relations which he bears to the anthropomorphous creatures immediately below him in the zoological scale.

Lawrence long ago said:—

"As the monkey-race approach the nearest to man in structure and actions, and their forms are so much like the human as to have procured for them the epithet *anthropomorphous*, we must compare them to man, in order to find out the specific characters of the latter; and we must institute this comparison particularly with those called orang-outangs."[1]

Now this is what Huxley has done with marked ability. Having shown that man and the monkeys are identical in the physical processes by which they originate, identical in the early stages of their formation, identical in the mode of their nutrition before and after birth; he next attempts to demonstrate that a marvellous likeness of organization is exhibited in their adult and perfect structure. He points out how man resembles the monkeys as they resemble one another; and how he differs from them as they differ from one another. Premising that the ape, which most nearly approaches man, in the totality of its organization, is either the chimpanzee or the gorilla; he selects the latter, and having determined the value and magnitude of the differences between it and man, he compares these critically with those which separate the gorilla from other animals of the same order. Our space will not permit us to follow Prof. Huxley through the details of this double comparison. We can present our readers with his conclusions only. These conclusions are as follows:—

That, in whatever proportion of its limbs the gorilla differs from man, the other apes depart still more widely from the gorilla, and that, consequently, such differences of proportion can have no ordinal value; that in respect to the number of ribs, the number of dorsal and lumbar vertebræ, the curves of the vertebral column, the proportional length of the spines of the cervical vertebræ, &c., there is no doubt whatsoever as to the marked difference between man and the gorilla; but there is as little, that equally marked differences, of the very same order, obtain between the gorilla and the lower apes; that the difference in the volume of the cranial cavity of different races of mankind is far greater, absolutely, than that between the lowest man and the highest ape, while, relatively, it is about the same; that the cranial capacities of some of the lower apes fall nearly as much, relatively, below those of the higher apes, as the latter fall below man; that what is true of the leading characteristics of the skull holds good of all minor features; so that for every constant difference between the gorilla's skull and the man's, a similar constant difference of the same order (that is to say, consisting in excess or defect of the same quality) may be found

[1] Lectures on Comparative Anatomy, Physiology, Zoology, and the Natural History of Man. London, 1848, p. 88.

between the gorilla's skull and that of some other ape; that, for the skull, no less than for the skeleton in general, the proposition holds good, that the differences between man and the gorilla are of smaller value than those between the gorilla and some other apes; that while the teeth of the gorilla closely resemble those of man in number, kind, and in the general pattern of their crowns, they exhibit marked differences from those of man in secondary respects, such as relative size, number of fangs, and order of appearance; that if the teeth of the gorilla be compared with those of an ape, no further removed from it than a *Cynocephalus*, or baboon, it will be found that differences and resemblances of the same order are easily observable; but that many of the points in which the gorilla resembles man are those in which it differs from the baboon; while various characters in which it differs from man are exaggerated in the *Cynocephalus:* that in short, not to go more closely in detail, greatly as the dentition of the highest ape differs from that of man, it differs far more widely from that of the lower and lowest apes; that whatever part of the animal fabric—whatever series of muscles, whatever viscera might be selected for comparison—the result would be the same—the lower apes and the gorilla would differ more than the gorilla and the man.

Many well-attested anatomical facts are brought forward by Professor Huxley in support of the above conclusions. He points out also the relation to this subject of certain characters of the hand, the foot, and the brain, about which much error has found its way into the books. Man is generally said to be *bimanous*, or to possess two *hands* terminating his fore-limbs or upper extremities, the terminations of his hind limbs or lower extremities being *feet*. All the apes, on the contrary, are said to be *quadrumanous*, or to have hands alone at the ends of both fore and hind limbs. It has been affirmed, too, that the brain of man differs from that of the apes in possessing the posterior lobe, the posterior cornu of the lateral ventricle, and the hippocampus minor. These statements Professor Huxley attacks with great vigour, and endeavours to show that they are wholly inadmissible. From a careful comparison of the human foot and hand, it is evident that the foot is distinguished from the hand by the following absolute anatomical differences: 1. By the arrangement of the tarsal bones. 2. By having a short flexor and a short extensor muscle of the digits. 3. By possessing the muscle termed peronæus longus. To determine whether the terminal division of a limb in any of the primates is a foot or hand, we have only to ascertain whether the above characters are present or absent. The hind-limb of the gorilla examined with reference to these features, is found to end in a true foot, with a very movable great toe. A prehensile foot, indeed, it is, but in no respect a hand. From the foot of man it differs in no fundamental character, but merely in proportions, in the degree of mobility, and in the secondary arrangement of its parts. The more carefully we examine the hand and foot in the various apes, the more evident is it, that they differ to a greater extent from those of the gorilla, than the gorilla's hand and foot do from man's.

With regard to the brain, Prof. Huxley shows that so far from the posterior lobe, the posterior cornu and the hippocampus minor, being structures peculiar to, and characteristic of man, as they have been over and over again asserted to be, it is precisely these structures which are the most marked cerebral characters common to man with the apes. He asserts that they are among the most distinctly simian peculiarities which the human organism exhibits. The posterior cornu and the hippocampus minor have

now been seen—usually, at least as well-developed as in man, and often better—not only in the chimpanzee, the orang, and the gibbon, but in all the genera of the old world baboons and monkeys, and in most of the new world forms, including the marmosets. As to the convolutions, the brains of the apes exhibit every degree of development, from the almost smooth brain of the marmoset, to the orang and the chimpanzee, which fall but little below man.

"So far as cerebral structure goes, therefore, it is clear that man differs less from the chimpanzee or the orang, than these do even from the monkeys, and that the difference between the brains of the chimpanzee and of man is almost insignificant, when compared with that between the chimpanzee brain and that of a lemur. * * * * *

"Regarded systematically, the cerebral differences of man and apes are not of more than generic value—his family distinction resting chiefly on his dentition, his pelvis, and his lower limbs." * * * * * *

"I have endeavoured to show that no absolute structural line of demarcation, wider than that between the animals which immediately succeed us in the scale, can be drawn between the animal world and ourselves; and I may add the expression of my belief that the attempt to draw a psychical distinction is equally futile, and that even the highest faculties of feeling and of intellect begin to germinate in lower forms of life. * * * * * *

"But if man be separated by no greater structural barrier from the brutes than they are from one another, then it seems to follow that if any process of physical causation can be discovered by which the genera and families of ordinary animals have been produced, that process of causation is amply sufficient to account for the origin of man. In other words, if it could be shown that the Marmosets, for example, have arisen by gradual modification of the ordinary Platyrhini, or that both Marmosets and Platyrhini are modified ramifications of a primitive stock, then there would be no rational ground for doubting that man might have originated, in the one case, by the gradual modification of a man-like ape; or, in the other case as a ramification of the same primitive stock as those apes."

As intimated above, the cerebral structure of man and the apes has, for several years past, been the subject of a controversy which has been carried on so vehemently as to have become memorable in the annals of comparative anatomy. In an anthropological point of view this controversy is of the utmost importance, inasmuch as it involves the precise position of man in systematic classification. The great Linnæus placed *Homo* in the order *Primates* with the rank of a genus. Blumenbach and Cuvier separated man from the monkeys, and placed him in the order *Bimana*. In 1856, Isidore G. St. Hilaire declared this order "to have become obsolete."[1] From the anatomical reasons just stated, Huxley concludes that Linnæus, the great lawgiver of systematic zoology, was correct, and that a century of anatomical research brings us back to his conclusion, that man is a member of the same order (for which the Linnæan term *Primates* ought to be retained) as the apes and lemurs. This order Prof. Huxley divides into seven families of "about equal systematic value," namely—

1. *Anthropini*, containing man alone.
2. *Catarhini*, " the old world apes.
3. *Platyrhini*, " all the new world apes, except the marmosets.
4. *Arctopithecini*, " the marmosets.
5. *Lemurini*, " " lemurs.
6. *Cheiromyini*, " " cheiromys.
7. *Galeopithecini*, " " galeopithecus.

[1] Histoire Naturelle Générale des Régnes organiques. Paris, t. ii. 1856.

In 1857, Prof. Owen astonished the scientific world by announcing that he had been led by purely anatomical considerations to separate man from the other Primates, and from the mammalia generally as a distinct *sub-class.* He affirmed in reference to the brain that the posterior lobe, the posterior horn of the lateral ventricle and the hippocampus minor were peculiar to man; and upon these cerebral characters he erected his sub-class and called it Archenecephala. This remarkable statement, so utterly without foundation in fact, at once brought him into collision with all preceding and contemporary anatomical authority. According to Gratiolet, as the order in which the cerebral convolutions develop themselves is different in man and the apes, the question must be settled by reference to embryology and morbid anatomy.

Whether man be one or many in origin, whether he first appeared upon earth four thousand or very many times four thousand years ago, and whether he constitutes, in natural classification, a distinct sub-class of the mammalia (the *Archencephala* of Owen), or a separate order, or forms merely a family, as Huxley maintains, in the great Linnæan order of the Primates, are manifestly, from all that has been said, inquiries of the most profound and curious interest. The question of the origin of man, as we have elsewhere maintained, and this is true also of the associated questions, is necessarily involved in that broader inquiry, the origin of all organic forms, and of life itself.[1] The problem, to the elucidation of which Darwin, Wallace, J. D. Hooker, and others are devoting themselves with such signal ability, as the severely satirized Lamarck and the transcendental Geoffroy Saint Hilaire long since did, must first be solved before the ethnologist can make the least satisfactory advance towards clearing up this perplexing subject. We need not wonder, therefore, why Sir Charles Lyell, in discussing the antiquity of man, devotes so large a portion of his elaborate work to the consideration of the theories of progression and transmutation in general, and especially to Darwin's theory of the origin of species by variation and natural selection. It is daily becoming more and more evident, that the origin of man, his antiquity, and his relation to the lower animals, all resolve themselves, as scientific questions, into the larger question of the tenability or untenability of Mr. Darwin's view. Although Sir Charles, with his usual caution, nowhere in his work expresses himself in decided support of these views, yet to the careful reader it is quite evident that the whole course of his argument is favourable to the theory of Darwin. Wanting the indispensable aid of the comprehensive facts upon which the generalizations of Darwin are based, it is not at all wonderful that Kant and Schiller, Prichard and Morton, and all others who have attempted to settle definitely the original unity or diversity of man, should have utterly failed. Innumerable and very rich are the detailed facts and observations of science. Through long centuries a numerous and industrious band of scientists have been occupied in chronicling them; and yet the veil of Isis still shrouds from mortal sight the manner and the time in which life and its varied forms first animated the globe. Indeed, science, through one of her distinguished sons, asserts the impossibility of denying positively that life, connected with some form, was not co-eternal with time, space, and matter.[2]

From the foregoing statements, it will be seen that the ethnology of the

[1] The Cranial Characteristics of the Races of Men in Indigenous Races of the Earth, p. 349.

[2] Dr. Joseph Leidy, Description of Remains of Extinct Mammalia, Journal Acad. Nat. Sciences, N. S., iii. 167.

present day is a science of polemics as well as of observation. It is at this moment in very much the same condition as was astronomy in the days of Galileo, or geology in the time of Hutton, or palæontology in that of Palissy. While yet in the infantile phase of its career, it is passing through the same fiery ordeal from which geology has but just emerged. During the animated discussions of which it has been and is still being made the subject, much talent and very diversified learning, however, have been brought to bear upon the obscure points of the science, in some respects, with happy results. Nevertheless, it is an acknowledged fact, and one much to be regretted, that, in the course of the controversy, by skilful but disingenuous appeals to popular prejudices, some of the combatants, more desirous of establishing certain favourite doctrines than anxious to engage in the slow and toilsome work of investigating the facts by which such doctrines must ultimately stand or fall, have greatly disparaged the zoological study of man and its honest and laborious cultivators.

However, during the past seventy years, many valuable observations have been made and placed upon record by Blumenbach, Soemmering, Prichard, Sandifort, Retzius, Eschricht, Nillson, Van der Hoeven, Morton, Davis, Thurnam, Wilde, Foville, Gosse, Minchin, Boudin, Blanchard, Engel, Zeune, Carus, Virchow, Lucæ, Fitzinger, Huschke, Von Baer, Williamson, Wilson, Pickering, and many others whom we might readily mention. To such investigators is chiefly due all actual progress in ethnology. They have confined themselves to original research in the different departments of the science under consideration, fully impressed with the idea that the legitimate work of the ethnologist, at present, is to accumulate facts, carefully sifting these, and separating the true from the doubtful and the false. For in this way only can the first principles of the natural history of man be determined, and its students obtain that favourable ground upon which alone they can successfully grapple with those ultimate questions whose solution, for want of the proper data, cannot yet be undertaken with any hope of success.

In view of these facts it will be seen, then, that the interests of ethnology are better cared for by examining the earliest historical and monumental records of human races, as Rosellini, Lepsius, Birch, Bonomi, Botta, Rawlinson, Layard, Kingsborough, and many others have done, with the view of ascertaining the physical characters which they exhibited in those remote times, their affiliations and amalgamations with each other; by studying the bony and industrial remains of man found in ossuaries and mounds, or buried in the earth, as Boucher de Perthes, Rigollot, Wilson, Davis, and others have done with so much success; by observing and collating the phenomena of hybridity after the manner of Kolreuter and Gärtner, and using these to elucidate the laws of human hybridism, as M. Broca[1] is now so ably doing; by applying, as Draper[2] is so philosophically attempting to do, the laws of embryology so well elaborated by Wolff, Von Baer, Coste, Rudolph Wagner, and others, to the explanation, not of the physical and intellectual development of the individual only, but also of the rise, progress, decay, and death of nations; by studying, after the example of

[1] His valuable papers on the subject of Hybridity may be consulted in Brown-Séquard's Journal de la Physiologie, Nos. 5, 6, 7, 8 and 10.

[2] In addition to his elaborate and eminently philosophical work, the title of which is quoted above, see chapters 4, 7, and 8, of his Human Physiology, and his remarkable paper read at the meeting of the British Association, held at Oxford, and entitled, "On the Intellectual Development of Europe, considered with reference to the views of Mr. Darwin and others, that the Progression of Organisms is determined by Law."

Boudin,[1] the geographical distribution of man, and the circumstances which influence this distribution, and the adaptation of different races to different climatic zones; by investigating philology in accordance with the able methods of Renan, Pott, Maury, Castrén, and others; by following the inquiries of Blumenbach,[2] Courtet de Lisle,[3] Pulszky,[4] and others, into the iconographic tendencies of the races of men; by studying the forms of the head, and other parts of the body, with reference to the embryonic and youthful forms of these parts, in the manner indicated by Knox,[5] Jaeger,[6] and others; and, lastly, by extending, as so many excellent observers have already done, our inquiries as much as possible into the anatomical, physiological, moral, and intellectual peculiarities of the existing races of men, in all parts of the earth.

Only by investigations of the profound and comprehensive character here indicated, can the true meaning of man's advent upon earth be fathomed, and the relations which he bears to the animal, vegetable and mineral productions about him, and the social and governmental relations of the different races of men, be understood. In this teeming field, as yet but imperfectly explored, must be sought those facts which are absolutely necessary to crown with success the philosophical, though still feeble, efforts recently made in France by Count de Gobineau,[7] in England by Buckle,[8] and in America by Draper, to demonstrate the laws, in accordance with which different nations, starting from apparently the same point, soon diverge and attain, through varying degrees of development, unequal degrees of civilization, from which they degenerate, and finally become extinct, in a manner in many respects parallel with the decay and death of nature's organic forms.

The scantiness and uncertainty of ethnological facts are not the only obstacles to the demonstration of these laws. The want of a strictly philosophical method is a still more serious difficulty with which the ethnologist is forced to contend. Prior to the time of Goethe, that profound thinker in science, it is well known that comparative anatomy had no existence as a philosophical study, but was simply a mass of details of uncertain relations and obscure import. When the illustrious German announced his views of the metamorphosis of skeleton forms, and endeavoured, by conceiving and demonstrating the vertebral theory of the skull, to show the unity which pervades and dominates over the plurality of skull forms, comparative anatomy began at once to assume its proper status as a philoso-

[1] Traité de Géographie et de Statistique Médicales, etc. Paris 1857. See also an excellent article, contributed by the same author to the Journal de la Physiologie No. 10, and entitled "Du Non-Cosmopolitisme des Races Humaines."

[2] Specimen Historiæ Naturalis Antiquæ Artis Operibus illustratæ eaque vicissim illustrantis, published at Göttingen, in 1808. See also an unpublished lecture, delivered in Göttingen, March 19, 1823, noticed in the Göttingen Gelehrte Anzeigen for that year, and entitled, "De veterum artificium anatomiæ peritiæ laude limitanda, celebranda vero eorum in charactere, gentilitio experimendo accuratione."

[3] Tableau Ethnographique du Genre Humaine. Paris, 1849.

[4] Iconographic Researches on Human Races and their Art, in Indigenous Races of the Earth.

[5] Contributions to the Philosophy of Zoology, with special references to the Natural History of Man. London Lancet, Oct., Nov., and Dec., 1855.

[6] Ueber die bei verschiedenen Völkern gebräuchliche künstliche oder gewaltsame Veränderung der Form des Kopfes und anderer Körpertheile. Von Dr. J. G. J. Von Jäger.

[7] Essai sur l'Inegalité des Races Humaines. Par M. A. de Gobineau. Paris, 1853.

[8] History of Civilization. By Henry Thomas Buckle.

phical science. The idea of Goethe, that all animal forms are essentially modifications of one and the same type, was gradually recognized as the ruling method of comparative anatomy, and under some one or other of its constituent formulæ, such as the correlation and subordination of parts, the division of labour in the animal organism, &c., has been productive in the hands of Geoffroy St. Hilaire, Von Baer, Cuvier, Milne-Edwards, Owen, and others, of such fruitful results. In like manner, botany was but an unmeaning registration of facts, until Goethe, in his *Metamorphoses of Plants*, made the world understand that the remarkable assertion of Linnæus, "Principium florum et foliorum idem est," embodied the germs of the true botanical method. By demonstrating as far as could be done, in his day, the developmental relation of the leaf to the entire tree, he gave to vegetable physiology a guiding principle whose importance has been freely acknowledged by Kiesser, Voigt, Nees von Esenbeck, Sprengel, and other eminent botanists. As with anatomy and botany, so with general physics and chemistry, no real advancement was made until the facts of these sciences were severally studied with reference to the methods which were worked out by Newton for the one, and Lavoisier for the other. The true method of research which rules in ethnology, and the demonstration of which is necessary to place this science upon a philosophical basis, has yet to be discovered. In its absence the co-ordination of the details of the natural history of man, and their reduction to a few broad and leading generalizations, have been attempted in vain. Years ago it was, and with some it still is the custom to interpret these details in accordance with certain theological dogmata. Others, again, with more success have applied to them the zoological method. But the conviction is daily gaining ground that this method of itself is insufficient for the great objects of ethnology, comprising, as this science does, two intimately connected groups of facts—the one physical and the other psychical.

It has long been seen that the old, ethnological societies of Paris and London were too limited in their scope to be able to seize upon the fundamental idea of ethnology as a philosophical study. The labours of both were directed mainly to the accumulation of facts. The Parisian society published two valuable volumes of memoirs, and then became extinct some years ago. The London society, after publishing four volumes, fell into a state of inactivity from which it has recently been aroused by the increasing interest manifested by scientific men in the subject, for the cultivation of which it was organized. A new volume just issued marks this happy revival. But ethnology is, after all, a branch only of anthropology. M. Broca, in a letter addressed to Dr. James Hunt, the President of the Anthropological Society of London, has well said that "to give to the study of man all its development, to create a veritable science, it is necessary to regard it under every point of view, and bring to bear at the same time the resources of anatomy, physiology, hygiene, ethnology, philology, history, archæology, and palæontology."

Such are the objects to be accomplished by the Anthropological Societies recently formed in Paris and London by some of the most distinguished *savants* of those cities, and the Anthropological Congresses organized in Germany through the instrumentality, chiefly, of Wagner and Von Baer. For the successful prosecution of their important labours these associations have our earnest wishes, and we heartily respond to the hope of M. Broca, "that after the conclusion of the American crisis, the *savants* of the United States will, in their turn, experience the desire to organize a society of anthropology." J. A. M.

# BIBLIOGRAPHICAL NOTICES.

Art. XVI.—*Transactions of American Medical Societies—*

1. *Medical Communications, with the Proceedings of the Seventy-first Annual Convention of the Connecticut Medical Society, held at Rockville, May 27 and 28, 1863.* 8vo. pp. 130.
2. *Extracts from the Records of the Boston Society for Medical Improvement, with Papers read before the Society.* By Francis Minot, M.D., Secretary of the Society. Vol. V. No. 1. From Jan. 13, 1862, to May 11, 1863, both dates inclusive. 8vo. pp. 116.

1. The seventy-first annual convention of the *Connecticut Medical Society* was opened with an able address from its president, Dr. J. G. Beckwith, of Litchfield, on the moral dignity and grandeur of the medical profession—showing its connection with civilization, political economy, and with all the enduring and substantial interests of national welfare and greatness; with a glance at the intellectual and moral endowments and the education necessary to qualify the physician for the discharge of the duties of his profession in the times and under the circumstances in which we live. Whether considered in reference to the very comprehensive, but at the same time succinct and clear historical sketch which it presents of the rise and progress of medicine as an art and science, or the views it advocates in respect to the natural and educational qualifications of the physician and the high code of ethics to which he owes constant obedience, the address of Dr. Beckwith speaks favourably of the talents and acquirements of its author, and furnishes much to interest and instruct his professional contemporaries.

The address is followed by a dissertation on Logic applied to Medicine, read before the convention by Dr. James C. Jackson, of Hartford. The author, by a very satisfactory course of reasoning, has endeavoured to point out the method we must adopt in our observations, investigations, and conclusions, in order that our theorems and problems may become more clearly intelligible, and that we may arrive at experimental truths and definite laws in our department of science, as well as scientific principles of practice. To show, in other words, that in medicine it is necessary for a thorough comprehension of all its details and bearings, and to render it in the highest degree practical for the conservation of the public health and for the cure of disease, that we should go beyond mere observation and empirical teachings to a higher and more thorough conception of medicine as a science.

The next article in the communications before us, is a Vindication of Army Surgeons, by Ashbel Woodward, M.D., Surgeon 26th Regiment Connecticut Volunteers. Among the host of surgeons who have been suddenly called to the performance of military duties, in the immense armies which the rebellion have caused.to spring up, there were doubtless at first, many, and it is possible that there may still remain some who are incompetent for the important services required of them. But that our army surgeons, taken as a body, are amenable to the sweeping charge of gross incompetency which has been preferred against them by those who have but an imperfect conception of the duties of army surgeons, and of the very great difficulties under which those duties must necessarily be performed, we do not believe. With Dr. Woodward we have good reason to conclude that the larger proportion of the gentlemen at present connected with the medical staff of the army are surgeons of science and skill, capable of discharging with credit to themselves, and advantage to the service, the arduous duties which devolve upon them. Among these are included some of the most distinguished and

competent members of the medical profession, who, impelled by motives of patriotism and humanity, have left the enjoyments, comforts and profits of domestic life to minister to our suffering soldiers in the field. The charge of incompetency brought against our military surgeons has been based, in part, upon the large number of operations, involving the loss of limb, which have been, unnecessarily as it is supposed, performed by them. Without stopping to inquire how far the accusation is well founded, we would merely remark, that on the field of battle and in the temporary hospitals necessitated in the course of an active campaign, extending over a large tract of country, and in which heavy forces on each side are engaged, there is little opportunity for the exercise of conservative surgery. Many a limb and even life have necessarily to be sacrificed, which could readily have been saved, were it possible to remove every soldier immediately upon his being wounded to a permanent hospital, well arranged, properly located beyond the field of military operations, and adequately appointed. This, however, cannot be done, and the consequent crippling of the beneficent offices of the army surgeon must be submitted to as one of the many evils incident to war.

The next paper is on the use of Calomel in Scarlatina, by Dr. E. K. Hunt, of Hartford. Dr. H. believes that by the judicious employment of calomel in scarlet fever the disease may be conducted not perhaps to a speedier, but with diminished violence to a favourable termination. He claims for the remedy no specific power over the disease in any of its forms or types. He has no hopes that it will arrest its deadly course in those cases where the malignant element is exhibited from the very onset, or remove the various dangerous sequelæ it leaves after it.

Dr. H. commences the treatment of scarlatina with an emetic of ipecac, or when the skin is hot and dry, of tartarized antimony, combined with a large dose of calomel—say from four to six grains for a child from four to six or eight years old. Subsequently he gives about half a grain, in conjunction with some appropriate refrigerant or anodyne remedy, every four hours. This he has found generally to maintain, throughout the entire course of the disease, free secretory action from all eliminating surfaces, and to keep the bowels in a sufficiently free condition. When the action is considerable, cooling and febrifuge remedies, such as the spirit of nitrous ether, the effervescing draught, sponging the surface freely with cold or tepid water, the free use of cold water internally, with such local remedies as may be indicated, are called for, and should be employed as circumstances require. In cases marked by oppression of the brain and nervous system, attended by moderate reaction, Dr. H. has found the cautious use of calomel, by its peculiar stimulant and revulsive properties, to assist materially in bringing about a wholesome reaction and thus aiding the powers of the system to cope successfully with the disease. But it is only for a few days that the continuous use of calomel is recommended or indeed allowable. After that, its occasional employment, and that generally only as an alterative, is all that is required. It avails nothing, Dr. H. remarks, towards *repairing* the damage often done to the organism by the disease—under these circumstances, indeed, a persistence in its use would but increase the mischief already done. In respect to the functional disturbances which sometimes follow the disease, weeks after it has run its course, and which probably have no other relationship to it than what the increased susceptibility to cold, irregularities of diet, etc., left by it may give rise to, the calomel, according to Dr. H., may be employed precisely as though the same indications had occurred under any other circumstances.

"It would be dealing unphilosophically," says Dr. H., "both with facts and all experience, to pretend that there were no cases of scarlatina in which calomel was inadmissible. Excessive irritability of the bowels sometimes; a peculiar irritation which, in some constitutions always accompanies the use of mercurials; positive nervous prostration owing to the shock incident to the onset of the disease, or to the oppression apparently due to the influence of the virus upon the brain and nervous system, and sometimes other causes, may for a time, and perhaps throughout the usually active stage of the disorder, contraindicate its employment. Such cases, however, happily, constitute but an insignificant

fraction of the whole number, and are always formidable under any plan of treatment."

The next paper is by Dr. Moses C. White, of New Haven, on the physiology of the crystalline lens, or the adjustment of the eye to distinct vision at different distances. Dr. W. points out the coincidence of his own views in respect to the uses of the fibrous structure of the crystalline lens, with those defended by P. A. Daguin, in his treatise on optics; and briefly refers to the opinions held by the leading physiologists of Europe on the mechanism by which the eye is capable of adjusting itself to correct vision at different distances, which opinions he considers as inconclusive or directly overturned by well-established facts. He refers to the several experiments of Duges, compared with the structure of the lens as developed by the researches of numerous investigators, and with certain facts connected with vision, taking in consideration, likewise, the direct experiments, in proof that changes do actually take place in the curvature of the crystalline lens, performed recently by Cramer in Holland, and Helmholtz in Germany, each experimenter working independently of the other. Dr. W. conceives the position to be established, that—

"The principal modification of the eye, to adapt it to distinct vision at different distances, consists in changes in the form of the crystalline lens, and it seems almost certain that these changes are produced by a vital contraction of the fibres of which the lens is composed, the fibres of the crystalline lens being endowed with the power of contracting, and changing the form of the lens in obedience to the will."

From the "sanitary report of Hartford County," presented by Dr. L. S. Wilcox, we learn, that during the years 1861, and more especially 1862, the county had been visited by an epidemic, which the physicians who witnessed it denominate "spotted fever." In respect to this epidemic, the report of Dr. W. is neither very full nor clear. Two cases are described.

These two cases are the only ones of which a record is known to have been made. Others, similar in feature and course, prevailed. The reports made to the society in 1862, bear testimony, that there was prevailing an epidemic influence of a marked character, affecting chiefly the mucous surfaces, and manifesting itself by diphtheritic exudations, or by vomiting and purging, and attended with alarming prostration. In some of the severer cases, the surface presents a dusky hue, or dark, or light red, or purple circumscribed spots; complaint being made of pain in the limbs, back, and head; the patient becomes early comatose, and, in fatal cases, death occurs early, and usually suddenly.

Dr. Moses C. White relates a case in which an iron nail, which penetrated and was broken off in the sole of the foot of a lady forty-five years of age, separated into twenty-six splinters, which, after causing great pain, suppuration at different parts of the foot, and severe constitutional disturbance, were removed at different times. During the three and a half months, during which the splinters of iron were in the foot, the patient had but little sleep. Twice she became wild and delirious from the intensity of the pain, and often the muscles of the foot and leg were affected with spasm. Her appetite was very poor, and she became extremely emaciated.

Biographical sketches are given of Dr. Luther Tichnor, of Salisbury, and of Dr. Jehiel Williams, of New Milford. From the latter we copy the following memorandum in reference to the disease known in New England as "typhoid pneumonia, or spotted fever," found among the papers of Dr. Williams after his death:—

"I was called, on the 23d of January, 1812, to visit the first two cases known as New Milford fever. The weather of the autumn of 1811 had been unusually mild, and during the month of December, for about six days, it was mild, and then, for about the same length of time, very cold. On the 24th of December there occurred one of the most severe snow storms experienced for many years—people in different parts of the town had their ears and noses frozen in taking care of their cattle and sheep. Fowls, sheep, and cattle perished in large numbers. The weather from December to May was changeable, and there were three ice floods in the Housatonic River quite near the village during the winter.

As the weather changed from mild to cold, the disease became more fatal, and in the month of March twenty-seven persons died in a circuit of two miles.

"There were cases of the disease in Roxbury and Washington, neighbouring towns in Litchfield County, and also in the towns of Amenia and Stamford, Dutchess County, N. Y. In 1813, there were a few cases in New Milford and the towns near, and the disease likewise prevailed in certain localities in New York, Massachusetts, and Vermont, not, however, in as malignant a form as in New Milford in 1812.

"The disease attacked persons between the ages of twenty-five and sixty. The most fatal cases were in those over thirty-five years of age. There were only three or four cases among children. The intemperate were very sure to die, while the temperate recovered from more severe attacks than destroyed the intemperate. The first two cases were seen on the 23d of January, 1812; two new cases occurred on the 24th—all four of which were dead by the evening of the 25th. Most of the cases seen in 1812 ran twenty-four, thirty-six, and forty-eight hours before the fatal event.

"The first symptom of the disease was a severe chill, similar to that of intermittent fever in severe cases; no reaction took place, the patient dying during the cold stage. In other cases reaction occurred, with fever, stinging heat, livid appearance of the cheeks, and bloated countenance. Some, in the cold stage, had pain in the head, with giddiness—a sense of weakness pervaded the entire body; there was much difficulty of breathing, as if a weight was upon the chest; there was some cough, with expectoration varying in appearance. In the more severe cases it was like dark soap—in a few cases there was a froth in mouth resembling cotton wool—such cases soon died. When the expectoration became copious and was streaked with fresh blood, the case usually recovered. When the tongue had a slimy appearance like dark putrid meat, the case soon proved fatal. The urine was scanty and high coloured. The pulse was frequent, the frequency augmenting with the progress of the disease; with the abatement of the symptoms, it became softer and less frequent. The discharges from the bowels were of a bilious character, and became more dark as the disease advanced. In some cases there was vomiting, or an attempt to vomit. After twenty-four or thirty-six hours from the attack the patient would become easy, appear to sleep, and in a moment the skin would become moist; but no improvement would result, unless the expectoration became streaked with fresh blood. The patients would desire cold water, which, when given to them, invariably increased their distress."

2. The Transactions of the *Boston Society for Medical Improvement* present a collection of notes and memoranda on subjects relating to medical and surgical pathology and therapeutics, all in the highest degree interesting, while they furnish valuable materials to assist the inquirer in the successful investigation of many questions of the highest practical importance.

We cannot attempt to present a continuous analysis of the numerous items embraced in the volume before us. They are, for the most part, so concisely stated, that to convey to our readers a correct idea of the facts they express we should have to transfer to our pages the greater portion of the extracts from the records of the Society as they appear in the publication before us. Our notice, therefore, must be confined to a few only of the extracts. We are not positive that in our selection we have always decided upon the most valuable portions, but happily, among items so generally interesting, we cannot go far wrong in our choice.

Four cases of tracheotomy in croup are given, in two of which the operation was followed by recovery.

The first case is reported by Dr. Cabot. The patient was a boy three years old. The disease had been of some three days' duration. The child had a loud, croupy, laboured respiration, a small, weak, rapid pulse, not intermittent; no decided lividity of face. A flapping râle could be heard both sides of back with tracheal sound, masking other sounds of respiration. Tracheotomy was decided on and performed. There was some venous hemorrhage, which ceased on admission of air into the lungs. The usual directions were given as to moist air, in-

jection of nitrate of silver, &c. The child expectorated a small amount of false membrane for several days; but at the end of a week from the operation he was so well that the tubes were removed. Entire recovery soon ensued.

The second case is reported by Dr. Minot. The patient was a girl nine and a half years old. The disease had been of about two weeks' duration: the symptoms were then, frequent hoarse cough, aphonia, with gradually increasing difficulty of breathing. No lymph could be seen in throat, but the laboured respiration was such as to prompt a resort to tracheotomy as the only means for saving the patient's life. The relief from the operation was immediate. No lymph was expelled—trachea intensely red. The tube was removed on the sixth day. On the morning of the ninth day, after a sudden occurrence of very cold weather, the symptoms of croup returned; the opening in the trachea nearly closed. The tube was replaced. The symptoms soon abated, and the tube was again withdrawn at the end of thirty-six hours. The child recovered entirely. No lymph was expectorated in this case, and none perhaps was formed; the disease was evidently acute laryngitis, with closure of the glottis from the swelling of the inflamed tissues. During the convalescence of this patient, an adult female of the family was attacked with acute tonsillitis, which terminated in resolution in a few days.

Dr. Gay stated that he had performed the operation on a girl three and a half years old, who had entirely recovered. Both before and after the operation she expelled a good deal of membrane. As in the case of Dr. Minot's patient, she caught a severe cold after a sudden cold spell, and was very hoarse for a day or two; but there was no obstruction to the breathing, nor was it necessary to replace the tube.

Dr. Minot was called to see a case in consultation. Three days before the patient—a boy seven years old—had been attacked with sore throat, cough, and hoarseness. When seen by Dr. M. there was aphonia, with laboured respiration. The tonsils were swollen, and had a few streaks of lymph on their surface. Tracheotomy was performed with immediate relief. Several fragments of membrane were expelled during the succeeding night and day, both by the mouth and through the tube. The breathing became again gradually obstructed, and the patient died on the fifth day after the operation—apparently from exhaustion. He had taken nourishment freely up to an hour before death. There was no autopsy, but it seemed probable, we are told, that the disease had extended to the bronchial tubes. During the last two days the tube was not introduced, the closure of the opening being prevented by the occasional introduction of the dilator and swab, by which the expulsion of the bronchial secretions was much facilitated.

The *dissection of a gravid uterus* was reported by Dr. Jackson. The uterus was from the corpse of an unmarried female, who declared herself to have been about six months pregnant. She had been consumptive for more than a year; the disease, contrary to the usual rule, is said to have rapidly increased from the date of her pregnancy. The uterus was entire and perfectly fresh. In length, in a straight line, it measured eleven and a half inches; in its largest circumference, twenty and a half inches. The placenta being felt through the parietes, at its posterior part, the organ was opened by a crucial incision anteriorly. The cord ran over the left shoulder and around the neck of the fœtus, which lay, with the occiput towards the left acetabulum. It was quite plump and healthy in appearance, weighing four and a half pounds. Through a blowpipe introduced into one of the uterine sinuses, these were inflated with moderate force, and the air soon appeared beneath the fœtal surface of the placenta. About one-third of the placenta was now peeled off, and a very careful examination made for any evidence of intervascular communication, but none was found; the usual appearance of the crescentic openings from the uterine sinuses was seen, but nothing more. A very nicely prepared coarse injection was next thrown into the sinuses, which, though it was extravasated to a considerable extent in the placenta, not the smallest vessel could be found passing into the mass from the uterus.

Dr. J. Wyman gave to the society an account of some observations made by him, on the different kind of bodies found in the dust deposited from or floating

in the atmosphere. The dust examined was obtained either from the floor of an unoccupied attic, or from plates of glass covered with glycerine and exposed to currents of air. The organic matter detected by aid of the microscope consisted of various minute fragments of vegetable tissues, such as woody tissue, spiral ducts, cuticle, simple, jointed, or stellated hairs, cells of tissues of leaves, pollen, &c. A few starch granules, resembling those of wheat, and giving the usual reaction with iodine, were occasionally found. In the dust from the attic of Harvard Hall, Cambridge, over one of the lecture-rooms, occupied by students for several hours each day, human cuticle and epithelium scales from the mouth were frequently detected. The lecture-room and attic communicate freely by means of a large ventilator. There were also found, less frequently, however, various spherical bodies; some of them spores of cryptogamous plants, and others resembling the eggs of some of the smaller invertebrate animals. All were provided with a well-defined cyst, which inclosed granules or cells, varying very much in size and appearance, in different specimens. Dr. Wyman was unable to identify the bodies in question, excepting that, in one instance, he detected the spores of a confervoid plant. As these were found before the conferva were beginning to be developed, it is probable they came from plants of the preceding year, and had been carried about by the winds after the drying up of the stagnant pools, in the latter part of the summer and autumn. Some of the egg-like bodies appeared to contain an early embryo, but which could not be referred to any particular species. One of the spores detected was especially interesting from its resemblance to pus and mucous corpuscules; so close was the resemblance, that one might be readily mistaken for the other. The fact is of importance, when considered in connection with the recent attempts made in Germany, to establish the presence of pus in the atmosphere, and in this manner to explain the transmission of certain forms of disease. The existence in the atmosphere of a large number of the spores of cryptogama gives a probable explanation of the transmission of certain of the algæ and fungi, which infest the bodies of man and animals.

The subject of the existence of organic forms in the atmosphere has been largely investigated by Pouchet, Quatrefages, and Pasteur.

A very unique case of spina bifida was reported by Dr. E. Huntington, of Lowell. The child was born on the fourth of January, at full period. It was well developed, and without other deformity than the spina bifida, and a slight varus of one foot. The spinal deformity was in the form of a tumour, hanging from the lower part of the vertebral column, on a line with the crest of the ilia, by a long peduncle, about a foot in length and about as thick as the little finger, but enlarging somewhat just before its junction with the tumour. The latter was nearly the size of two fists, rounded in form, but tapering towards the peduncle; fleshy in feel, not tense, but with sense of fluctuation. The surface had a smooth, shining appearance, without cutis. The cutis was well developed upon the peduncle, but terminated abruptly where the body of the tumour began. Upon the birth of the child, a ligature was applied to the peduncle, as near as possible to its origin, and it was then divided. The ligature slipping, gave rise to an almost fatal hemorrhage. The child did well, however, and so continued to do up to May 20th. The remaining portion of the peduncle presented a central cavity; into this a catheter was passed, through which a few teaspoonfuls of clear serum escaped; on being heated the serum became solidified. To prevent any further escape, a ligature was applied. There appeared, at first, to be a considerable deficiency of bone where the peduncle originated, and for two months the cicatrized surface bulged out quite perceptibly when the child cried. The opening, however, gradually contracted, leaving, at the date of the report, only an irregularity of surface, to be felt upon pressing down upon the vertebræ; the remains of the peduncle being then about one-quarter of an inch in length.

The cavity of the tumour contained a little dirty fluid; it was lined with a serous membrane; its parietes varied in thickness from $\frac{1}{4}$ to $\frac{1}{2}$ an inch. Upon the cut surface many cysts were exposed; the intervening tissue being lax but tough. The peduncle had shrunk to $2\frac{1}{2}$ inches in length. Slit open throughout, no trace of a lining membrane appeared, but rather common integument. The cavity through its centre was about one-fifth to one-fourth of an inch in dia-

meter; it was with considerable difficulty a small probe was passed through it into the tumour. With the cavity of the latter the canal of the peduncle communicated, at about where the tumour began to taper; not directly, but just within the orifice of another adjoining canal, about three-fourths of an inch in length, and large enough to admit a probe about two lines in diameter. Upon the inner surface of the peduncle, and closely connected with it by a lax cellular tissue, were two or three quite large nerves and a large bloodvessel, which were gradually lost within the tapering portion of the tumour.

*The Existence of a Posterior Fontanelle exceptional.*—Dr. Jackson believed, that by most anatomists and writers on midwifery, a deficiency in the skull of the young infant, at the junction of the occipital and two parietal bones, constituting the posterior fontanelle, is described, and in an obstetrical point of view it is evidently considered as a matter of some practical importance. Humphrey on the Skeleton says, speaking of the two fontanelles, "The hinder of the two is the smaller, and is closed a few months after birth." Dr. J. said, that many years ago his attention had been directed to this subject, and though he could not speak from figures, nor even from notes, he had examined many crania, and the following were his general conclusions: that the posterior fontanelle is generally closed in the mature fœtus, and occasionally some weeks earlier; that, where it exists, it is generally an insignificant affair, and should not be described in connection with the anterior fontanelle, still less in comparison with it; and that, though it varies in size, when it does exist, it can never be called a large opening. The mistake has probably arisen from the fact, that the existence of the fontanelle has been based upon an examination of the heads and not the crania of new-born infants. The upper extremity of the occiput being stiff and unyielding, and the adjoining portions of the parietal bones so far the reverse, that there is an appearance of an actual deficiency of bone; or, again, upon an examination of the crania of infants that have been stuffed out when drying, so as to cause an actual separation of the bones.

*Ergot during Labour.*—A very interesting discussion took place, at two consecutive meetings of the society, on the use of ergot as an accelerator of labour. When properly given, in the right cases, and at the proper stage of labour, we know of no agent from the use of which more beneficial results may be anticipated; but when resorted to in improper cases and stages of labour, merely to save time, by shortening the attendance of the accoucheur, we know of none more mischievous in its effects; destroying, most generally, the life of the child, and jeoparding, to a fearful extent, that of the mother. We would remark, as the question came up in the discussion, that we have met much more frequently with retention of the placenta, from what is called hour-glass contraction of the uterus, in labours where ergot has been given, even where all things have appeared most favourable for its use, than in those labours in which it has not been resorted to. D. F. C.

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ART. XVII.—*Reports of American Hospitals for the Insane.*

1. *Of the McLean Asylum, for the year* 1862.
2. *Of the Butler Hospital, for the year* 1862.
3. *Of the Retreat at Hartford, for the fiscal year* 1862–63.
4. *Of the New York City Lunatic Asylum, for the year* 1862.
5. *Of the King's County (N. Y.) Lunatic Asylum, for the fiscal year* 1861–62.
6. *Of the Friends' Asylum, for the fiscal year* 1862–63.

1. In the report for 1862 of the *McLean Asylum*, Dr. Tyler thus writes in regard to a recent improvement of that hospital:—

"The completion of the edifice for the accommodation of the most demonstrative forms of mental disorder, makes an era in the history not only of this Institution, but also of asylum construction and architecture. The means afforded for its erection were ample; the time and careful attention given to all the details of its arrangements were without stint, and the result in the present ad-

mirable structure is more than satisfactory. Spacious and cheerful apartments, commodiously furnished, free admission of sunlight, thorough ventilation and comfortable temperature, architectural beauty within, and pleasant surroundings without, access at will to the grounds, all are attained in consistency with the entire safety of the occupants."

An inclosure of nearly five acres, laid out and planted in the style of English ornamental gardening, has been opened to the use of the patients in the female department. With its trees and shrubbery, its walks and drive-ways, it cannot fail to be of great utility to its invalid frequenters.

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients in the asylum, January 1, 1862 . . | 87 | 101 | 188 |
| Admitted in course of the year . . . | 40 | 42 | 82 |
| Whole number . . . . . . . . | 127 | 143 | 270 |
| Discharged, including deaths . . . . | 49 | 45 | 94 |
| Remaining, December 31, 1862 . . . | 78 | 98 | 176 |
| Of the discharged, there were cured . . | 18 | 21 | 39 |
| Died . . . . . . . . . . | 11 | 7 | 18 |

"This Institution, in common with many kindred ones, has registered fewer admissions in the last year than has been usual. Terrible and many as are the evils resulting from the war, the increase of insanity does not yet seem to be one of them, and it is not difficult to understand how it may have acted in its prevention."

But, farther on, he says: "The war has produced some mental disease. The intense loneliness of a deserted home, the apprehension of harm to the beloved ones away, the shock of the fatal event when at last it comes, have, in some instances, unsettled the reason; and a few, too, have come from the camp and the field with a brain damaged by overwork, excitement, and exposure."

The moral treatment at this, one of the oldest and best appointed hospitals in the country, is thus compendiously noticed.

"The ample facilities possessed by this Institution for interesting and diverting those whose lot, for a time, falls here, have been in constant requisition during the year. Riding, driving, all sorts of games and athletic exercises in-doors and out, lectures, concerts, celebrations of the different holidays, work for the soldiers and for charitable purposes, and a well assorted library, all have contributed to the great end of occupying, comforting, and improving the household. Each year adds much to the available means for good, and the Asylum to-day possesses greater resources than ever before, for the accomplishment of the noble purposes of its establishment, in the results accumulated by the labours and experience of nearly half a century."

A considerable part of the report is devoted to an exposition of the various methods in which incipient insanity advances so insidiously as not to be suspected by its victim or his surrounding friends.

The report closes with the following just tribute to the memory of the late Dr. Luther V. Bell, who died at his post as Brigade Surgeon of the Army of the Potomac:—

"For nearly twenty years Dr. Bell held the position of Superintendent of the Asylum, identifying himself with all its interests, and directing its daily management with a comprehensive skill, sagacity, and forecast, a purity and elevation of purpose, and a scrupulous faithfulness to every relation involved, which secured for him, for those intrusted to his care, and for the Institution, the happiest and the most abundant results. The accuracy and variety of his knowledge, the soundness of his judgment, and his remarkable faculty of adapting means to ends, meet one here at every step, while the recognized method of treatment, the traditionary usages and rules of the house, bear the indelible stamp of his thorough and exact comprehension of the needs of the insane, and his wonderful tact in providing for them. His active and commanding intellect, his extraordinary attainments as a scholar, philosopher, and psychologist, his extensive knowledge of everything pertaining to the phenomena, management, and history of insanity, his able and long-continued efforts and success in diffusing and establishing correct views of the nature and treatment of the disease,

have justly caused him to be regarded as one of the most distinguished of the many great men who have ever adorned the medical profession. His inbred sense of honour, his entire removal from all meanness and duplicity, his sterling integrity and inflexible moral courage, his keen sense and ardent love of right, leading him to its defence in utter disregard of any personal consideration, and in the face of any obstacle, and qualifying and inspiring all his every-day life, and yet with no touch of pharisaical exactness or pretension, commanded the admiration and respect of all who knew him, and gave him an uncommon power of personal influence, while it made him of inestimable worth as a friend. His courteous and dignified bearing, his gentle manner and quiet humour, his inexhaustible store of anecdote and useful information, gave him a wonderful charm as a champion. Strong, though not demonstrative, in his feelings, warm in his attachments: he loved his home, his friends, and his daily association, and devoted himself to their welfare. He loved his country, and felt the severity of her fiery trial, and, faithful as always to his convictions of right and personal obligation, he gave her as his last offering the rich accumulation of his experience and—his life: a brilliant example of lofty Christian patriotism."

2. It will, perhaps, be recollected that, in his report for 1861, Dr. Ray, of the *Butler Hospital for the Insane*, portrayed the evils consequent upon the reading to an insane patient a notice of an application, and the proceedings thereon, for the apointment of a guardian over the said insane person. This exposition produced the desired effect in Rhode Island, for at the next following session of the Legislature of that State the following law was enacted:—

"In any application before a Court of Probate for the appointment of a guardian to the person and estate of a lunatic who may be confined in the Butler Hospital, the Court may proceed thereon without giving personal notice to the respondent, or without his appearance, whenever the superintendent, or the person having charge of the Butler Hospital, shall certify upon the citation that said respondent is a lunatic and confined in said Hospital, and that the personal service thereof will be detrimental to his mental condition."

It would be well for the interests of the insane were similar laws passed in the other States.

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients in Butler Hospital, Dec. 31, 1861 . | 69 | 66 | 135 |
| Admitted in course of the year . . . . | 16 | 20 | 36 |
| Whole number . . . . . . . . | 85 | 86 | 171 |
| Discharged, including deaths . . . . | 20 | 19 | 39 |
| Remaining, Dec. 31, 1862 . . . . | 65 | 67 | 132 |
| Of the discharged, there were cured . . | | | 17 |
| Died . . . . . . . . . . | | | 5 |

After the presentation of a brief synopsis of the medical record for the year, Dr. Ray, as is his wont, enters into a discussion of some special subject connected with the treatment of the insane. That which occupies the larger portion of this report is the question of modern reforms.

His course of argument is as follows:—

"The reformer's creed frequently contains but a single article of belief, namely, this, because a thing is bad, therefore the directly opposite thing is necessarily good. The effect of this fallacy has been strikingly manifested, for instance, in the controversy, not yet settled, respecting mechanical restraint as applied to the insane. Everybody admits that it has been grossly abused, but an immense difference prevails as to the practical inference that should be drawn from the fact. While it leads one party to use it for proper purposes and in a judicious manner, so as to secure its benefits and avoid its evils, it leads another to disuse it altogether as an unmitigated wrong."

Plenty of reasons are given, by each party, for its course; there is "a touch of the romantic" in the thought of governing the insane merely by "moral suasion or the gentle laying on of hands;" and the plan was received with great *éclat* in England.

"One thing leads to another, and the idea of complete non-restraint was

followed, in the fulness of time, by that of banishing all those distinctive architectural arrangements supposed to be indispensable to the proper care and custody of the insane. Open fires on the hearth, windows without guards, and doors without locks, have been adopted in one or two hospitals lately erected in England. But the careful observer, who studies insanity like any other object of scientific investigation, will hardly be satisfied with the reasons offered for such a radical reform; and though willing to accept results as the proper tests of their soundness, he will require that the experiment shall be tried on a large scale, by various parties, and its indirect and contingent as well as immediate results be fairly taken into the account."

Because evils possible to the insane have not arisen under this system, we have no right to infer that they will not arise. Hence every evil must be provided for. "The man who congratulates himself on the success of his measures for preventing suicide, on account of entire exemption for several years, will find his self-complacency somewhat ruffled when, without any change of practice, several cases occur in rapid succession."

Again, in the reforms in this specialty, individual traits are mistaken for general conditions, and thus conclusions are jumped at. The reasoning is like this: "A patient long subjected to mechanical restraint improves under its disuse, therefore no patient requires it, and complete non-restraint must be the unexceptional rule. Another is annoyed by the sight of locks and guards, and which, in fact, are unnecessary for him, therefore they are annoying to all and unnecessary for any. Another desires to go out unattended, and undoubtedly is all the better for the privilege, therefore unrestricted freedom in this particular should be the general rule. Deductions like these may seem somewhat puerile, but they are scarcely exaggerations of what have actually been made."

While these proposed reforms show an admirable spirit, they appear to exhibit "confusion of thought both as to the ends which are proposed and the conditions of a successful experiment."

As regards these conditions, it should be remembered that morbid movements of the nervous system are often slow, and hence no general scheme of management should be adopted from any one phase of that movement. We know not what may be developed. And as in individuals, so in hospitals. Months may pass without the necessity of any mechanical restraint, to "be followed by as long a period of its abundant use." Hence, if any plan or provision of management have discoverable defects, the assertion that "no harm has arisen from it, so far," is unsatisfactory proof of its excellence. To inspire confidence, it must be independent of "the chances of fortune and the shortcomings of men."

In regard to the proposed ends, it may be assumed that "the philosophical test of social and political reform—the greatest happiness of the greatest number—must not be exclusively adopted here. A provision is not to be hastily discarded merely because it has been attended by abuses, or because its evils, on the whole, seem to overbalance its benefits. The careful inquirer will first ascertain whether, by some administrative change, the former may not be prevented, and the latter retained. To give up a provision which is known to serve an excellent purpose, because in the hands of the careless and heartless it has been made an instrument of wrong, may be wise under some circumstances, but can hardly be considered a triumph of professional skill. True science, true skill, consists in meeting the exigencies of each particular case, and though these must sometimes be subordinate to the general good, this necessity must be regarded as a defect rather than a merit. *The question we have to deal with is, how we can best reach the needs of each one of those individuals who make up the collective body under our charge; and so long as we keep this end before us, we may be sure we are on the right course.*"

The reasons given in favour of some reforms appear to spring from false notions of insanity, and especially of the thoughts and feelings of the insane. All architectural safeguards, it is said, should be avoided because they constantly remind the patient of his infirmity. But many patients welcome these means of restraint because of an "habitual sense of insecurity." Others recognize the necessity of them because they are conscious of their own unfitness to be at large. "Much of the repugnance which the insane are supposed to feel to the

restrictive arrangements of a hospital, may be fairly attributed rather to that captious, fault-finding spirit, so common in the disease, than to any keen sensibilities in the matter."

But, it is said, if restraint *is* required, let it be "the look and the touch of an attendant, not barbarous implements of wood and iron." But how far is confidence to be placed in attendants, how well soever qualified both by nature and by experience?

"For a short period and an imminent emergency, we may be warranted in relying upon them implicitly. But lengthen the period, or render the contingency more remote and uncertain, and to that extent personal vigilance becomes unreliable. An attendant placed in charge of a patient incessantly bent on self-destruction, may be safely relied on for several hours; but let it be his sole business to prevent a patient from striking when the impulse comes, which may be but once in two or three months, and who that knows anything of the subject supposes that the blow will not be struck at last? The continuity of attention required for this purpose may not be impossible, but in practice it would be idle to expect it. In fact, there is really no relation between the end and the means. The question is not which of the two kinds of restraint, personal or mechanical, is preferable in this case, but whether the latter is not the only one capable, in the nature of things, of effecting the purpose. Considering the matter in reference to its immediate effects on the patient, and unconnected with theories or biases, it seems difficult to conceive how there could be two opinions about it. And in the class of cases where either would be admissible, I have been led by twenty years' experience to believe that a simple contrivance of leather or cloth placed on the limbs, performing its service quietly and steadily, is infinitely preferable to an array of attendants holding the hands and feet, and at every relaxation of their efforts, provoking renewed struggles from the patient."

The practice of disregarding, or attempting, by devices of management, to keep in abeyance some prominent traits of insanity, appears to have been carried too far. There has been a disposition to throw the insane too much upon their powers of self-control. Say what we will, the world has not "always been mistaken in the idea that a disposition to mischief is necessarily a frequent element of insanity." Even if this were eradicated, there is another which *must* limit our confidence in the insane. "*The guiding, determining power of the patient—the balance wheel, if I may use the figure, which regulates the mental movement—is generally more or less impaired, and some foreign power must, to that extent, take its place.* For this reason he is taken from home or his customary surroundings, where he is following the bent of his disordered fancies, and placed where his liberty of action is greatly curtailed, and his movements directed by others. To some, scarcely anything more is necessary than the unavoidable restrictions of the hospital. In others, the gravity of the disturbing element may call for the utmost amount of restriction at our disposal. *In some shape or other, restriction is an essential element in all hospital management of insanity;* but it would be preposterous to contend that just so much or so little is the exact measure best suited to all cases alike."

Towards the close of the discussion, a few pages are devoted to the subject of general commissions for the supervision of hospitals.

3. The most important numerical results at the *Hartford Retreat for the Insane*, as embodied in the report of that hospital for the official year ending with the 31st of March, 1863, are as follows:—

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients at the beginning of the year | 105 | 116 | 221 |
| Admitted in course of the year | 79 | 91 | 170 |
| Whole number | 184 | 207 | 391 |
| Discharged, including deaths | 72 | 88 | 160 |
| Remaining at the end of the year | 112 | 119 | 231 |
| Of those discharged, there were cured | 32 | 40 | 72 |
| Died | 14 | 14 | 28 |
| Whole number admitted since its opening | 1912 | 2168 | 4080 |

| | Men. | Women. | Total. |
|---|---|---|---|
| Discharged . . . . . . . . . | 1800 | 2049 | 3849 |
| Cured . . . . . . . . . | | | 1931 |
| Died . . . . . . . . . | | | 421 |
| Single, admitted since March 31, 1848 . . | 728 | 730 | 1458 |
| Married " " " . . | 574 | 704 | 1278 |
| Widowed " " " . . | 60 | 207 | 267 |
| Between 20 and 30 years of age at first attack | 360 | 544 | 904 |
| Between 30 and 40 " " " | 243 | 302 | 545 |

*Causes of death the past year.*—General debility, 2; exhaustion from acute mania, 4; diarrhœa, 3; phthisis, 4; erysipelas, 2; paralysis, 2; epilepsy, 2; "simple exhaustion," 3; "disease of the brain," 2; chronic diarrhœa, general paralysis, suicide, and disease of the liver, 1 each. "The year," remarks Dr. Butler, "has been one of general prosperity and quiet progress."

Aside from the statistics and the acknowledgment of donations, the report consists almost wholly in an abstract, with quotations, of an article on insanity, published in Mr. G. W. Childs' *National Almanac,* for the year 1863.

4. "Each year," remarks Dr. Ranney, in his report for 1862, of the *New York City Lunatic Asylum,* "confirms me in the opinion that the course of moral treatment which now obtains in hospitals for the insane is doing much to lessen the severity of the most repulsive and formidable phases of insanity. The avoidance of restraint has diminished the necessity for its adoption. The removal of everything which would irritate the patient tends to make the disposition milder and more affable, and this change of disposition is an important advance toward a perfect mental restoration. A comparison of the old system with the new, as to results, will prove the wisdom of the modern method of treatment. Sixteen years ago this asylum had only 383 inmates, of whom at least 30 were confined with leathern straps and iron wristlets, and 40 more were constantly kept in their rooms; but recently, although the number has increased to 800, there has not been an average of two patients confined to their rooms, and only at long intervals has a restraining-strap been used. This, when resorted to, was only to confine the hands of patients who had very strong suicidal tendencies.

"The iron wristlets and leg-locks, as a means of restraint, have not been in use since the year 1848. To this change is to be attributed, in a great degree, the more orderly condition of the house."[1]

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients in hospital January 1st, 1862, . . | 304 | 501 | 805 |
| Admitted in course of the year . . . . | 133 | 209 | 342 |
| Whole number . . . . . . . . | 437 | 710 | 1147 |
| Discharged, including deaths . . . . | 155 | 223 | 378 |
| Remaining, December 31st, 1862 . . . | 282 | 487 | 769 |
| Of those discharged, there were cured . . | | | 165 |
| Died . . . . . . . . . . . | 51 | 46 | 97 |

*Causes of death.*—"Phthisis pulmonalis, 25; paralysie générale, 20; congestis cerebri, 13; epilepsia, 6; senectus, 5; chronic diarrhœa, 5; paralysis, 5; typhomania, 3; exhaustive mania, 3; anæmia, 3; apoplexia, 2; chorea, 1; typhoid fever 1; anasarca, 1; ascites 1; dysenteria, 1; pneumonia, 1; albuminuria, 1."

Although there were seventeen attempts at suicide, no one of them resulted in fatality. The following tabulated exposition of the suicidal propensity for the year will be found interesting:—

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[1] It will doubtless be remembered that this hospital was the last American stronghold of the old system of mechanical restraints, and that they were there continued for years after they had become, in some other hospitals, as nearly abolished as they are at the present day.

| Attempted Suicide. | Men. | Women. | Total. | Nativity of Patients. | Men. | Women. | Total. |
|---|---|---|---|---|---|---|---|
| Before admission | 7 | 16 | 23 | Ireland | 4 | 12 | 16 |
| After admission | 5 | 5 | 10 | Germany | 2 | 5 | 7 |
| Before and after do. | | 1 | 1 | England | 1 | | 1 |
| | — | — | — | Prussia | 1 | | 1 |
| Total | 12 | 22 | 34 | Belgium | 1 | | 1 |
| Attempted once | 7 | 14 | 21 | Canada | | 2 | 2 |
| Twice | 3 | 3 | 6 | Austria | | 1 | 1 |
| Thrice | 2 | 1 | 3 | New York | 3 | 2 | 5 |
| More than three times | | 4 | 4 | | | | |

| Nature of Attempt. | Before Admission. Men. | Women. | Total. | In Hospital. Men. | Women. | Total. |
|---|---|---|---|---|---|---|
| Jumping from windows and heights | | 2 | 2 | | | |
| Hanging . . . . | 2 | 2 | 4 | | 3 | 3 |
| Starvation. . . . . | | 2 | 2 | 2 | 1 | 3 |
| Drowning . . . . | 2 | 3 | 5 | 3 | 3 | 6 |
| Cutting throat . . . | 1 | 1 | 2 | | | |
| Cutting arm . . . | 1 | 2 | 3 | | 1 | 1 |
| Drinking Laudanum . . | 1 | 2 | 3 | | | |
| Taking morphine . . . | | 1 | 1 | | | |
| Strangulation . . . | | | | | 4 | 4 |
| Not specified . . . | 1 | 7 | 8 | | | |
| Total of attempts . . . | 8 | 22 | 30 | 5 | 12 | 17 |

We make the following extract, believing that Dr. Ranney therein alludes to one of the true causes of the diminished number of admissions to the hospitals since the beginning of the war. It is undoubtedly true that many insane men have gone into the army. This is, in our opinion, wrong, but we know not that, under the circumstances, it could have been prevented :—

"The war excitement does not seem to increase the number of admissions; on the contrary, there is a very important reason why it should at first diminish the number. Many of the ordinary inmates of an asylum are only partially insane, and although it would be exceedingly difficult for them to obtain constant employment in the city, this class of persons can readily find positions in the army. Conversing sensibly on most subjects, as soldiers their mental defects are not quickly discovered, while, in the city, their immediate intercourse with their employers soon discloses their true condition. Nor has the war given any peculiar character to the delusions of those admitted. This results principally from the seat of war being so far distant, and the number so small that have returned home. Several patients admitted the past year were discharged soldiers; but from a careful examination, the opinion was formed that all were insane previous to enlistment."

5. The records of *King's County (N. Y.) Lunatic Asylum* for the fiscal year ending with the 31st of July, 1862, furnish the following general results :—

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients at the beginning of the year . . | 137 | 193 | 330 |
| Admitted in course of the year . . . . . | 91 | 113 | 204 |
| Whole number . . . . . . . . | 228 | 306 | 534 |
| Discharged, including deaths . . . . | 84 | 84 | 168 |
| Remaining, July 31, 1862 . . . . . | 144 | 222 | 366 |
| Of those discharged, there were cured . . | 44 | 43 | 87 |
| Died . . . . . . . . . . . . | 14 | 18 | 32 |

Died of phthisis, 8; general paralysis, 6; exhaustion, 5; ulceration of intestines, 2; epilepsy, 2; apoplexy, paralysis, meningitis, congestion of the brain, inflammation of the brain, diarrhœa, dysentery, peritonitis, and congestion of the liver, 1 each.

No attempt is made in the report to explain the great predominance of females among the patients.

"The number of admissions during the year," says Dr. Chapin, "has been somewhat augmented in consequence of the war. Seven soldiers have been under treatment, of whom four were discharged recovered, one died, and two remain, one of whom is probably incurable. The latter was formerly a police officer in Brooklyn, and became insane while on duty at Newport News, from the effects, it is supposed, of sunstroke. But of those whose insanity is attributable, directly or indirectly, to our national difficulties, the largest proportion were females. Some incident of unusual interest is associated with nearly every one of these cases. A mother became insane in consequence of having two sons impressed into the Southern army; she has also a son in the Northern army; and a young lady lost her reason in consequence, not so much of the enlistment of her brother, which took place early in the war, as on account of the peculiarly hazardous nature of the duty to which he was assigned."

It is gratifying to perceive that this hospital is beginning to receive pretty liberal donations of reading matter. The great mercantile maelstrom of New York has heretofore whirled so nearly everything in its vicinity into its special current that the needs of suffering humanity have been too often overlooked.

6. In taking up the "Forty-sixth Annual Report of the State of the *Asylum for the Relief of Persons Deprived of the Use of their Reason*," we are reminded, perhaps for the hundredth time, of the awkwardness as well as the interminability of the title of that comparatively small, but very excellent hospital, which, though in the immediate vicinity of the great city of Philadelphia, nestles in rural quietude among its native groves and its cultivated willows. That title is so long, so periphrastic, that it is seldom, if ever, used, except in official documents. The hospital, if we are not mistaken, is always spoken of as the "Friends' Asylum," or the "Frankford Asylum." Will not our friend, Dr. Worthington, turn his attention to this matter, and effect a "reform?" For reasons heretofore given, the word "asylum" is objectionable. Then why not alter the said title to "The Friends' Hospital for the Insane?" Or, better still, why not follow the example pursued at Providence? Josiah Butler gave forty thousand dollars to the hospital in that city, and the title of the establishment became "Butler Hospital for the Insane." Will not some one in the city of brotherly love by his liberality justify this institution in making a similar change in its title?

| | Men. | Women. | Total. |
|---|---|---|---|
| Patients in Friends' Hospital, March 1st, 1862 | | | 62 |
| Admitted in course of the fiscal year . . | | | 13 |
| Whole number . . . . . . . . . | 32 | 43 | 75 |
| Discharged, including deaths . . . . . | 7 | 12 | 19 |
| Remaining, March 1st, 1863 . . . . . | 25 | 31 | 56 |
| Of those discharged, there were cured . . | 2 | 6 | 8 |
| Died . . . . . . . . . . . | 2 | | 2 |

Died of gastritis, 1; of erysipelas supervening paralysis, 1.

"In its early and acute stages, insanity, owing to the high grade of accompanying cerebral irritation, is not unfrequently attended with considerable danger to life, and such cases during the past, as in previous years, have furnished us with the greater portion of sickness requiring active medical treatment. When patients have escaped the dangers of the acute form of the disease without the recovery of their reason, and remain insane for the rest of their lives, they often, when properly cared for, continue to enjoy many years of uninterrupted physical health; and among this class of our patients during the past year, the standard of general health has been very satisfactory. In many cases, however, the depression of the vital powers consequent on the diseased condition of the brain, to which the mental disorder is due, continues for life and renders the insane less able to resist the causes as well as attacks of disease to which they may be exposed, and their lives are thus materially shortened. In other cases, especially of those whose constitutions have been impaired by intemperance or other

excesses, or whose minds have given way under a long continued pressure of care and anxiety, the original disease of the brain rapidly increases, and speedily ends in fatal disorganization."

We make some selections from that part of the report which relates to the management of the patient. It is pleasant to perceive that at this, the first hospital for the insane, whether in America or Europe, at which a course of scientific and literary lectures was delivered before the patients, this important branch of moral treatment has not fallen into disuse.

"The Library and Museum have continued to be resorted to by both male and female patients at different hours of the day. The lecture room, with its very complete apparatus, has been in very frequent use during the winter, and the exhibitions of dissolving views with the magic lantern, on two evenings of the week, have been attended by most of the patients, and have afforded them a high degree of satisfaction."

"An important element of success in the application of the various measures designed for the welfare of the insane, is their separation into small groups or companies, so that patients with the same form of disease, and consequently requiring the same remedies, may as far as practicable be subjected to the same details of treatment. In order that hospital classification may be perfect, it is not necessary that the subdivision of patients shall be very minute, or that it shall comprise any fixed number of classes. A more important point is, that each class shall be so small that the attendants in charge shall not be overburdened with their duties, so as thus to be prevented from giving to the patients the needful attention that each case requires. It is easy to understand that in a large institution, with several hundred patients, though there may be numerous wards and classes, the number of patients in a ward, and their proportion to the attendants employed, may be much greater and the classification consequently more defective than in a smaller institution, where, owing to the reduced number of wards, the classification might appear to be less complete.

"In our Asylum the wards are designed for ten patients each, and the proportion of attendants to patients being as one to four, which is perhaps larger than in any similar institution in this country, enables them to give that minute personal attention to each case that is so necessary to the best welfare of the insane."

We believe that the relative proportion of attendants to patients has always been larger at this hospital than at any other in the country. P. E.

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ART. XVIII.—*Hospital Notes and Memoranda; in Illustration of the Congestive Fever, so-called, or Epidemic Cerebro-Spinal Meningitis, as it occurred in the Winter and Spring of* 1862–63, *in the Camps in and around the Town of Newbern, N. C.; with some account of its Origin, Nature, and Treatment.* By J. BAXTER UPHAM, M. D., Surgeon in Charge of Stanly General Hospital, 18th Army Corps, Department of North Carolina. (Reprinted from the Boston Medical and Surgical Journal.) 8vo. pp. 38. Boston, 1863.

THE disease to which the notes and memoranda of Dr. Upham refer, is, in every point of view, an interesting one. In many parts of the United States it has prevailed of late years as an extensive epidemic, and in the great majority of cases its fatal course has not been stayed by any plan of treatment that has been put in practice. Every contribution, therefore, which is adapted to improve our knowledge of its pathology and treatment cannot but be in the highest degree acceptable.

The records of cases, some twenty in number, presented by Dr. U., are mainly from the note books of his associates on the medical and surgical staff of the General Hospital at Newbern, N. C.; while the autopsies were made, under his inspection, by the attending surgeons in whose wards the deaths occurred. These cases, in every instance, originated in the camps and barracks adjoining the

town, from whence they were brought into the hospital at an earlier or later period after the attack.

The town of Newbern is situated upon the river Neuse, at its junction with the Trent, some forty miles from its entrance into Pamlico Sound. Both rivers are navigable for a few miles above their junction. There are no tides at this point, but the depth of water is affected by the force and direction of the wind. The town is built upon a flat, sandy soil, raised only a few feet above the water. The surrounding country is level, alternating with sandy plains and swamps, for a mile or two from the outskirts of the town, and then begins the great, almost impenetrable, pine forest, with its marshes and tangled undergrowth. The climate is, for the most part, mild and salubrious in winter and spring, but hot, humid, and subject to malarial influences in summer and autumn.

The troops were encamped mainly just beyond the town, in the driest practicable spots, and sheltered partly in tents or barracks. The barracks were built of green stuff (dry timber not being within reach); the logs, mostly of hard pine, being taken immediately from the forest, or from out the water where they had been lying for some weeks. The barracks were necessarily cold and damp and redolent of pitch and paludal moisture, while, from their size in proportion to their inmates, and their internal arrangement, generally, the supply of fresh air within the wards was entirely inadequate, and the general diffusion of light and heat throughout them impracticable.

The regiments most affected by the epidemic were the 44th, 45th, and 51st Massachusetts and the 10th Connecticut. The three first had been stationed at Newbern less than two months when the disease appeared, while the last named had remained in or near the same locality for nearly a year. These regiments were quartered in barracks. Isolated cases also occurred in the other regiments occupying tents. The 24th Massachusetts, an old regiment quartered in barracks near the 44th, it is believed, escaped the disease; in company with the 10th Connecticut, the 24th Massachusetts left the department before the cases of the disease became multiplied. These occupied, before leaving, a sandy, sterile plain on the right bank of the Neuse, some half a mile beyond the town, and elevated perhaps five or six feet above the level of the river. The 44th, which suffered most, was nearest the bank: in its immediate vicinity were a couple of small marshy bogs, through which flowed a stream of water. The water mainly used for drinking and culinary purposes was brackish and unpalatable; it was obtained from wells in the vicinity of the camp. Beyond and above the encampment, to the edge of the woods, as well as opposite, towards the river Trent, a broad, sandy plain stretched out for a mile or so. The woods in this direction had been extensively felled since the occupation of the town, as a precautionary measure. The 45th and 51st Massachusetts regiments were also encamped on the right bank of the Trent, two miles above the town, on a flat, alluvial, sandy soil, about 12 or 15 feet above the level of the river, and dotted with numerous small pools of stagnant water, even within the limits of the camp. The distance from the river at this point to the swampy woods beyond, is perhaps three-fourths of a mile. Over this extended and barren plain the winds have free sweep, bringing, in a dry time, a simoom of sands upon the camps. The water used by the last named regiments was mostly obtained from a barrel sunk in the ground at the river's edge.

The attack of the epidemic was usually sudden; the patients, most commonly, continuing on duty, without complaint, up to the very period of their seizure. Its subjects were, in most instances, the robust and apparently most healthy individuals, between the ages of 18 and 24 years.

The attack was ushered in with a sense of chilliness; headache, oftentimes experienced chiefly at the occiput; dizziness, pain in the back and limbs, occasionally very severe, attended sometimes with rigors, and with nausea and vomiting. A sense of stiffness in the muscles of the face and neck was often an early symptom. Some attacks commenced like a common cold, with a tendency to paralysis of the tongue, and some of the muscles of the face, while the respiration would be difficult and irregular, giving cause to fear congestion of the lungs. Early in the attack, tenderness at the nape of the neck and along the spine was often present. The skin was usually moist, but hot; the face suffused, often of

a dusky hue, with distortion of features, congested and suffused eyes. For the most part, there was not active delirium, but rather perversion of the intellect, with dulness and indifference to outward objects. From this condition the patient could be roused, and then would answer questions correctly. The tongue had, at first, a white, creamlike coating, which subsequently became yellowish or brown at the centre and base, and, more rarely, towards the close of the attack, dry and fissured. There was loss of appetite, but not usually very urgent thirst. The action of the heart was irregular, sometimes tumultuous; to it the pulse did not always respond. In most cases, the latter was accelerated—not strong—occasionally intermittent. The bowels were regular, or alternately loose and confined. Petechiæ, very similar to the true typhus eruption, were often present upon all parts of the body excepting the face; they were persistent under pressure, and varied in hue from a very dark raspberry to the blackness of true petechiæ. Purpureal spots, of large size and abundant, were sometimes present, and were always a grave symptom. There was no marked tenderness of the epigastrium or abdomen. The more protracted cases were attended, towards their close, with sordes of the teeth and lips, and involuntary evacuation of urine and feces. Decubitis was mainly on the side, with the head often retracted, and the neck rigid and stiff—partial opisthotonos. There was invariably great restlessness and jactitation. As an accompaniment, and occasionally sequel to the disease, iritis and synovitis were observed in several cases—in one pericarditis. The patients often died without much indication of exhaustion.

The foregoing constituted the more prominent and constant symptoms of the disease—they were never all observed nor even the majority of them to be present in the same case. Some singular and anomalous symptoms were occasionally met with, as a pleasing delirium, with loquacity, priapism and decidedly erotic desires. In a few very severe cases no moan or sound of any kind escaped the patient, but the restlessness was fearful, and ceased only at death. In other cases there was much moaning. Stiffness of the muscles of the neck and back, or some perverted action of the muscles of the face, amounting at times to spasm, was almost pathognomonic.

The duration of the disease varied from less than thirty-six hours, to three, four, or six weeks, and even longer. According to Dr. Upham's observation, its most usual duration was from three or four to seven days.

In regard to the prognosis, this was in general unfavourable. Of about 40 cases received into the Stanly General Hospital, 28 proved fatal. Of the 5 cases referred to by Dr. Kneeland, all died, as did also the 14 communicated by Dr. Jewett. Dr. Cowgill reports 5 cases of recovery out of 12, being the largest ratio of recoveries in proportion to the number of cases treated.

The anatomical lesions were chiefly confined to the brain and spinal cord. When death occurred within two or three days, there was commonly opalescence of the upper surface of the cerebrum—seemingly of the subarachnoid fluid; increased vascularity of the meninges of the brain and spinal cord, especially the pia mater; a large increase of serum, clear or turbid, and mixed with flocculi of lymph, in the subarachnoid space and ventricles, with, most usually, even in cases of the shortest duration, an abundant exudation, at the base of the brain and medulla oblongata, of thick, yellowish, apparently semi-organized lymph. Conjoined with these lesions there was more or less passive congestion of the lungs, increase of the pericardial fluid, and occasional engorgement and enlargement of the liver or spleen. When the disease had lasted from seven or eight days to several weeks, the deposits on the brain were usually more marked, especially at its base, around the pons Varolii, in the sulci of the cerebrum and cerebellum, covering the surface of the oblongata, and extending down upon the spinal cord, sheathing it, in some cases, throughout its entire extent. The deposit was either puriform, or concrete and semi-organized, and, frequently, from two to three or four lines in thickness. It was found also in the ventricles, especially in the posterior cornua of the lateral ventricles, in its concrete form, or else tinging and thickening, with an opaque greenish pus, the serous fluid of the whole cavity. The meninges of the brain, the pia mater especially, showed, not unfrequently, evidences of congestion. The only lesions noticed in the thoracic and abdominal viscera, were passive engorgement of the lungs in

their depending portions, the occasional presence of lymph in the pericardium and ventricles of the heart, and sometimes enlargement of the liver and spleen.

In two cases reported by Dr. Jewett, the one terminating in twenty-four hours, the other in twenty-three days: in the first the lesions were, adhesion of the meninges, either between themselves or to the surface of the brain, requiring them to be torn at certain points from the surface of the latter; the arachnoid space filled with straw-coloured serum, to the extent of perhaps three or four ounces; effusion into the lateral ventricles, especially the right, congestion of entire surface of brain, with small patches of lymph at base of cerebellum. In the spinal canal, a greatly increased quantity of cerebro-spinal fluid, of a yellowish and milky hue; meninges much congested, and the cord itself softened. In the second case the dura mater was strongly adherent over the longitudinal sinus, the lateral ventricles were filled with about three ounces of straw-coloured fluid; vessels of choroid plexus strongly injected; the fourth ventricle filled with serum and pus: a large deposit of lymph, three lines in thickness, covering the pons Varolii and inferior surface of the medulla oblongata. The meninges of the cord much congested; about half an ounce of sero-purulent fluid in the spinal canal; the spinal cord enveloped in a layer of lymph, in some places two or three lines in thickness, extending down, and sheathing to their very extremities, the cauda equina and sacral nerves.

Of the seven fatal cases recorded by Dr. Cowgill; in one where death occurred within thirty-six hours, there was cloudiness of the entire surface of the cerebrum and medulla oblongata, increased vascularity of the meninges, effusion of serum into the ventricles, injection of the pia mater of the spinal cord, evidences of inflammation along the whole course of the latter, with effusion of turbid serum in the lower part of spinal canal. In another case of thirty-four days' duration, there was injection of the pia mater, exudation of yellowish lymph along the sulci of the upper surface of brain, and a thicker deposit, of apparently plastic semi-purulent matter, on its inferior surface, especially over the pons Varolii and oblongata, with two ounces of serum in the lateral ventricles. In the remaining five cases, which were intermediate in duration, the lesions were, increased vascularity of the meninges, especially the pia mater; a thin deposit of lymph on the upper surface of the brain, in two of the cases; in three, a more abundant and consistent deposit of lymph-like matter at the base of the cerebrum, cerebellum and medulla oblongata, extending into the spinal canal in the form of either lymph or a sero-purulent fluid. In all the cases, there was distension of the ventricles with serum or sero-purulent matter.

In five cases that terminated fatally on or before the third day, observed by Dr. Upham, the lesions were, in two cases, congestion of meninges of brain; in three, extensive deposit of lymph at the base of the brain, especially of the cerebellum; in one, slight cloudiness, confined to the superior surface of the cerebrum, with some opacity of the arachnoid; in one there was absence of all abnormal deposits. In two cases, which lasted thirty-four and thirty-six days respectively, Dr. U. detected, in the first, cloudiness and slight deposit of lymph between the convolutions of the cerebrum, and a firm layer of coagulable lymph, two lines in thickness, on the lower surface of the cerebellum and oblongata; in the second, some increase of vascularity of the pia mater; a thin, milky fluid beneath some portions of the pia mater; on the upper surface of the brain, and at its base, a mass of tenacious yellowish lymph, three-eighths of an inch in thickness, extending down upon the spinal cord. In both cases the ventricles were distended with a sero-purulent fluid. In the six intermediate cases the lesions were, more or less congestion of meninges in three; in one only clouded appearance of arachnoid, and in five copious effusion at the base of the brain and medulla oblongata.

In respect to the true character of the disease under consideration. Dr. U. remarks that, from the limited number of cases that have been adduced, no definite conclusion can be arrived at, but he believes that by the process of exclusion, we may be able to approximate towards the truth.

"That it was not, in its essential essence and primarily, an inflammation of the membranes of the brain and spinal cord, it seems fair to conclude, Dr. U. thinks, from the failure of all the known means of combating such disease in

producing any adequate result. Venesection and local bleeding had alike no control over the violence of the disease. Blisters were not well borne. Calomel and saline cathartics in large doses produced no good effect. The outward demonstrations of the disease, if carefully studied, would seem to be rather the results of some subtle agency that had suddenly overwhelmed with its depressing effects the vital powers, than the excited and painful expressions of active inflammation." "The disease lacks, also, many of the important symptoms and other characteristics of the 'congestive fevers' of tropical climates. It is not intermittent, nor uniformly or commonly remittent. It occurs at a season of the year when miasmatic diseases do not prevail, and among the new troops who have not been previously exposed to malarial influences, by preference. It does not yield to, nor appear to be favourably influenced by, quinine, however early and perseveringly administered. The anatomical lesions, in the cases examined, which, other things being equal, would seem to accord with the supposition of its malarial origin, are the rare exception, not the rule.

"The disease seemed to Dr. U. rather to partake of the nature of typhus, in a severe and malignant form, identical in its essential elements with the typhus fever of Great Britain, which, under the names of maculated typhus, ship, camp or jail fever, has many times been observed in this country—having, in this instance, a special direction to the meninges of the brain and spinal cord, as, in other epidemics, the weight of the disease has fallen at one time upon the brain, at another upon the lungs, or other important viscera of the thorax, or of the abdomen. Springing up epidemically or otherwise, wherever there is long-continued crowding and exclusion of light and air, coupled with deprivation, hardships and exposure. In the disease under consideration, the circumstances of its origin are similar in kind, if not in degree, to those under which the typhus group of diseases most frequently originate. Very many of its phenomena and phases correspond with those witnessed in typhus epidemics. The suddenness of its accession, the dusky hue of the face, the suffused and injected eyes, the petechial eruption, and purpural spots, the defective innervation of the respiratory and circulatory systems, as shown by the laboured, irregular breathing, and the often tumultuous and intermittent action of the heart, the sluggishness, but in other respects general freedom from functional derangement of the thoracic and abdominal viscera, and, after death, the passive engorgements, and the dark-fluid, sizy, character of the blood, all point to the typhus element of the disease, and would seem to indicate a line of therapeutical management similar to that which experience has found most effectual in the treatment of that malady."

In respect to the treatment pursued in the cases to which the notes and memoranda before us refer; in the beginning of the epidemic it being considered of malarious origin the usual remedies in such affections were assiduously employed. Quinia, in some cases to the extent of from sixty to eighty grains, was given within ten or twelve hours from the first attack, but with no good result; in conjunction, stimulants and purgatives of calomel were freely used. Antiphlogistic remedies were also tried—cupping, wet and dry, to the back of the head and nuchæ—saline purgatives; epispastics to inside of thighs, calves, and ankles; frictions along the spine, with enemata of turpentine and brandy. When there was marked cerebral excitement venesection was most freely employed, but without averting or mitigating the symptoms. Calomel in combination with ipecac. in doses of two grs. of the former, and half a gr. of the latter, repeated every two hours, in conjunction with frictions or sinapisms along the course of the spine, seemed, in several cases to have had a good effect. Ergot, recommended by Dr. Brown-Séquard in certain affections of the spinal cord unaccompanied with active inflammation, was given in the form of fluid extract, in doses of from ten to fifteen minims, every four hours. Several of the cases thus treated recovered. Often a beneficial effect attends the use of camphor water in combination with carbonate of ammonia. Dover's powder and solution of sulphate of morphia were given at night to induce sleep.

D. F. C.

ART. XIX.—*Manual of Instructions for Military Surgeons, on the Examination of Recruits and Discharge of Soldiers.* With an Appendix, containing the Official Regulations of the Provost Marshal General's Bureau, and those for the formation of the Invalid Corps, etc. etc. Prepared at the request of the United States Sanitary Commission, by JOHN ORDRONAUX, M.D., Professor of Medical Jurisprudence in Columbia College, New York. New York: D. Van Nostrand, 1863. 12mo. pp. 238.

2. *A Manual of Instructions for Enlisting and Discharging Soldiers.* With special reference to the Medical Examination of recruits, and the detection of disqualifying and feigned diseases. By ROBERTS BARTHOLOW, A. M., M.D., Assistant Surgeon U. S. Army; Surgeon in charge of McDougall General Hospital; Professor of Mil. Med. Jurisprudence, Army Medical School. Adopted by the Surgeon-General for issue to medical officers of the army. Philadelphia: J. B: Lippincott & Co., 1863. 12mo. pp. 276.

1. THE Manual of Dr. ORDRONAUX is, for the most part, as he himself states in the preface, a free translation of the French code of instructions upon the infirmities or diseases that unfit a man for military service. In the appendix attached are published the code of instructions relating to the United States Army, recently adopted by the Board of Medical Officers convened in Washington; the Regulations governing the formation of our Invalid Corps; the Prussian list of disqualifying diseases, and the Regulations governing the formation of their Invalid Corps.

As our army is now to be composed of drafted men instead of volunteers, the regulations adopted after abundant experience in France and in Prussia, where every man not disqualified must serve in the army, are those that are to be followed in this country. Formerly in examining a recruit, the object was to detect a concealed infirmity; at the present time the object is to prevent the simulation of physical disabilities. The volume by Dr. Ordronaux will be found exceedingly useful by officers who are concerned in the recruiting or discharging of soldiers.

2. The Manual of Dr. BARTHOLOW is evidently the production of one who has enjoyed very considerable experience in this country as a military surgeon, and who also knows how to avail himself of the labours of others. Medical officers, and all those engaged in the recruiting service of the United States, who are without experience, could not possess a work better calculated to aid them in the discharge of their duty. We have read the work carefully, and with great pleasure and instruction, and we have rarely been more favourably impressed with an author's knowledge, judgment, and correct appreciation than in the present instance. This little volume is a valuable addition to the library of the military surgeon, and its teachings may be implicitly relied on. W. F. A.

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ART. XX.—*Consolidated Statement of Gunshot Wounds.* By JOHN H. BRINTON, Surgeon U. S. V. Surgeon-General's Office, Washington, July 1, 1863. 8vo. pp. 11.

THIS pamphlet contains tabular statements of the gunshot injuries treated in the United States Army General Hospitals during the months of September, October, November, and December, of the year 1862. These tables have been compiled by Dr. Brinton by the aggregation of the consolidated tabular statements of nearly all of the army general hospitals for the months specified. They are now published in a separate form, in advance of more extended details illustrative thereof, by the desire of the Surgeon-General, for the information of the medical officers of the army, and of the profession at large, and are to be considered, as this distinguished officer states in a prefatory cir-

cular, as an earnest for the future of still larger and more valuable contributions to the literature of Surgery.

The entire number of cases of gunshot injury reported is 20,930; and the tables set forth respectively, the Seat and Character of the Wounds, with the result; the Treatment; the Character of the Missiles; the Amputations performed; the Excisions performed; the Extraction of Balls; the results of thirty-five cases of Trephining; the Ligature of Bloodvessels; and the Miscellaneous Operations.

The preparation of tables such as these demands an extraordinary amount of zeal, industry, and caution, in order to make them correct. The value we set upon them must depend in a very great measure upon our estimate of the character of the person by whom they have been compiled, and it is needless to say that no one can be more deserving of the confidence of the profession than the compiler of these tables—Dr. Brinton. W. F. A.

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Art. XXI.—*Transactions of the Obstetrical Society of London.* Vol. IV. For the Year 1862; with a List of Officers, Fellows, &c. 8vo. pp. 338. London, 1863.

The present volume of the Transactions of the Obstetrical Society equals fully, in the interest and practical value of its contents, either of its predecessors. Of several of the papers comprised in it, very full abstracts have already been given in our quarterly summaries for the past year.

The annual address of the President, Dr. W. Tyler Smith, contains no suggestions directly applicable to the condition of the profession in this country—none, at least, which could be successfully carried into practice without a radical change in the political institutions under which we live; we shall pass it by, there fore, and proceed at once to a brief notice of such of the papers contained in the volume as have not already been noticed in preceding numbers of the *Journal.*

Dr. G. Hewett, of London, relates a case of *spina bifida* (pp. 5, 6), occurring in a child delivered by one of the midwives of the British Lying-in Hospital, October, 1861. The labour was easy, and occurred at full term. The mother stated that she had had a fall two months previously. The child, a female, presented no defect save that the spinous processes, which were readily recognizable by the finger as far as the junction of the lumbar and sacral regions, were, with the entire bony arch over the middle of the sacrum, defective. At this spot was situated a tumour, smooth, soft, easily compressible, measuring one and a half inches across, and raised above the surrounding surface three-quarters of an inch. It evidently contained a fluid, which oozed *guttatim* from a minute aperture in the skin covering it. Two days after birth Dr. H. found the greater part of the skin covering the tumour of a deep red colour—one portion, however, was of a yellowish hue, and if not already gangrenous, threatening to become so. The tumour was felt under the skin to be surrounded by a slightly elevated bony margin. Its fluid contents could be made in great part to pass inwards by pressure. The general condition of the child was good, the movement of its lower extremities unimpaired, its body warm; it sucked vigorously and slept well. Pads were applied on each side the tumour to guard it from external friction or pressure, more active treatment being deferred until the skin covering it should assume a more healthy aspect.

For the first six days the patient went on well; it then, however, became weaker as regarded its power of sucking, convulsions set in, and twelve days after birth death took place. The case when first seen seemed to be a favourable one for an attempt at cure. It was hoped that by carefully guarding the skin against friction, by the use of collodium, and slight pressure kept up by bandages, retraction of the sac might have been produced.

Another case of spina bifida is reported by Dr. D. Richards, of Brighton; of which the history is given in a subsequent part of the volume (pp. 191–94).

It will be more convenient, however, to notice it in connection with the foregoing. In this second case the defect in the spine became associated with hydrocephalus.

The patient, a female, was the first-born of a strong, healthy, well-formed mother. At the lower part of the dorsal region spina bifida existed, with an absence of three entire spinous processes. The integuments also were wanting, so that there existed an opening instead of the usual tumour filled with a fluid—the spinal column being apparently exposed to about one inch in depth. Angular curvation of the spine at this part was present; the palate was cleft, and there was talipes varus of both feet; the head at birth was healthy and of normal size.

Immediately after birth, the aperture in the back began to close by granulations. At the end of twenty-eight days the left leg descended from the shoulder to its natural position; two weeks subsequently the right leg partially descended. The cavity in the spine had now become entirely closed up with granulations level with the surrounding skin. The granulating surface in wet weather appeared wet and inclined to throw out a thin discharge, while in fine weather the surface looked dry and as if covered with skin.

As the cavity closed, the infant's head was observed to enlarge. Thirty-one days after birth its circumference was $18\frac{1}{4}$ inches; two weeks subsequently it was $18\frac{3}{4}$ inches; two weeks later, 19 inches; at the end of another two weeks, $19\frac{1}{2}$ inches; two weeks later, $19\frac{3}{4}$ inches; while at the end of the next three weeks it had a circumference of 23 inches. At this size, very nearly, it remained for over ten weeks, when a diminution was observed. A slight anasarca, which had existed for a short time, began at the same time also to diminish, and by the end of five days had altogether subsided. The size of the head was now reduced to that which it presented at birth, and the aperture in the spine was completely healed. Six days later, five months and seven days subsequent to birth, the child died from exhaustion. No examination of the body was allowed.

The second paper in these Transactions is *A Report on Mr. Spencer Wells' Case of Exfoliation of the Female Bladder*, by Dr. Harley. (pp. 13–17.)

The specimen sent to Dr. H. for examination was passed, it is stated, by the urethra six weeks after a severe instrumental labour. From the time of delivery up to the period when the specimen was voided the patient was confined to her bed, with symptoms of acute cystitis, associated with nephritis. The urine, examined about three weeks after delivery, was albuminous, and contained blood corpuscles, pus cells, chylous matter, and renal tube casts. At the same time the fresh urine was very much loaded with carbonate of ammonia, and was intensely alakline, even at the moment when passed. This condition of the urine would alone, in the absence of all other evidence, be sufficient to justify the diagnosis of cystic and renal disease. An examination per vaginam the day before the specimen was expelled detected nothing in the vagina; shreds of a sloughy-looking tissue were, however, observed to project from the orifice of the urethra. A hard swelling had been felt in the anterior wall of the vagina, supposed by one practitioner to be an abscess, by another, a foreign substance in the bladder. After the discharge of the substance the patient's health rapidly improved. She is married, and there is no apparent cause for suspecting her of deceit.

The specimen is an animal membrane, in the form of a bag, perfect on all sides save one, in which are several irregular rents. Exteriorly its colour is white, and even to the naked eye distinctly muscular. The muscular fibres, upon close inspection, were found to be of the involuntary kind, and distributed in the same interlacing manner as in the urinary bladder. Interiorly the bag is of a dark colour, and covered throughout with a gritty deposit, the removal of which brought into view a smooth, mucous surface. The gritty matter upon analysis proved to consist of crystalline phosphates and urates. Upon the muscular coat of the specimen were found, under the microscope, a number of tube casts and granular cells. But, as Dr. H. remarks, as the specimen had been in water for two days, these may have been accidentally floated out from the interior of the organ. On minute inspection of what seems to be its outer surface, there is seen an irregular patch, of about two inches by one in extent, of smooth tissue, bearing a close resemblance to serous membrane, being, probably, a por-

tion of peritoneum. The distilled water in which the specimen was steeped for two days, deposited a quantity of phosphate of lime, and of urate of soda and ammonia. The supernatant fluid had a milky appearance, resembling lime water, which it retained even after filtration. Neither ureters nor their orifices were to be detected in the specimen. It was impossible to ascertain whether the specimen is an entire organ, or only the portion of an organ, in consequence of the torn condition of its lower part.

From the foregoing data Mr. H. is led to the conclusion that the specimen is a portion of a urinary bladder, which at one part is, probably, of its entire thickness—as it appears to possess at this part, an internal mucous, a middle muscular, and an external serous coat.

Taking it for granted that the specimen in question was to be viewed as a true pathological specimen, it appeared to Dr. H. that we must accept as true one or other of the following theories :—

"1st. That a woman voided, by the natural passage, nearly her whole bladder. Or, 2d. That the entire mucous membrane, with nearly the whole of the muscular coat, had become, by some means or other, dissected from the neighbouring tissues, and exfoliated in the form of a perfect cast."

Dr. Tanner referred to a case, the exfoliated membrane obtained from which is preserved in the collection of the Royal College of Surgeons, which is adapted to throw light upon the foregoing—bearing out the correctness of the second of the theories proposed by Dr. Harley.

Dr. J. G. Swayne related a curious case of *discoloration of the skin during pregnancy* (pp. 18, 19). The subject of the case was a blond, with rather florid complexion, brown hair, and blue eyes, twenty-six years of age. Had always enjoyed good health. After her fourth labour, Dr. S. observed a very general discoloration of both forearms and hands, much more marked, however, upon the dorsal than on the palmar aspect. It was most intense at the wrist, where the skin was of a rich, yellowish-brown hue, as dark as that of the mulatto. From the wrist it became gradually paler, until at the elbow, the skin regained its normal colour, but so gradually as to render it impossible to indicate any line of separation between this and the morbid tint. At the wrist, however, the line of demarcation was very distinct, the colour being deeper and extending further on the dorsal than on the palmar surface. On the backs of the hands and fingers it assumed the form of isolated patches, with irregular crescentic outlines, and occupied chiefly the knuckles. The patches coalesced on the forearms, giving to them a more uniform dark tint; still the patches, having irregular concave edges, could be traced, inclosing, here and there, circular patches of white skin. A similar discoloration of the skin had been present in each of the lady's preceding pregnancies. The dark colour first appeared towards the end of the third month, and gradually increased until labour set in. After delivery it soon began to diminish in intensity, and at the end of three months had disappeared. The lady's mother had borne two children, and in each of her pregnancies both the arms and neck presented the same form of discoloration.

Henry Raynes, Esq., of Gringley, reports a case of *difficult labour from the locking of the heads of twins* (pp. 19, 20), analogous to the one described in the last volume of the *Transactions* by Dr. Pollock.

Labour had considerably advanced before Mr. R. was called in. The breech presenting was promptly converted into a footling case. The further progress was impeded by the locking together of the heads of two children, which were reversed so as to allow of the inferior margins of the lower jaws being placed in juxtaposition. Mr. R. excised the head of the child whose body was born, and which was ascertained to be dead. The head of the other child being in advance of the first, retained its place until after the birth of the latter, the detached head of which retiring above the brim, permitted the progress of the second child, which was born without manual assistance, and expired soon after birth. The detached head of the first child was now extracted by a little manipulation, the fingers of the operator being inserted in its mouth.

Dr. Pollock's case, already referred to, and one by Mr. Eaton, noticed in *Braithwaite's Retrospect*, vol. xiv., are the only other cases similar to that of Mr. Raynes, which are known to be on record.

A case of *retained menses* of two years' duration, *from atresia vaginæ: puncture of rectum followed by recovery*, is related by I. Baker Brown (pp. 21, 27).

Where there is a deficiency or entire absence of the vagina in a young female, unattended with arrest of development of the uterine organs, pain and other evidences of an effort to menstruate may recur monthly, and pass off without the patient suffering any serious inconvenience. There is a liability, however, of a constant accumulation of the menstrual fluid, giving rise, ultimately, to constant painful distension of the uterus, for the relief of which surgical interference will be demanded. Such cases are, confessedly, of rare occurrence; in the majority of them the attempt made to afford relief by puncture, or otherwise, has had an untoward result. The general opinion of surgeons is that, when the uterus is punctured through the rectum death almost invariably occurs; how far this opinion is borne out by facts it is impossible to say. Dupuytren has opened the closed womb through the vagina in several cases. Inflammation of the uterus of so severe a character ensued that he finally abandoned the operation, allowing the patient to die quietly and slowly, rather than to accelerate her death by an operation. Since his time, however, the womb has been punctured on many occasions through the vagina without a fatal result.

In cases of complete atresia vaginæ the discharge of the retained menstrual fluid can be effected only by an operation per rectum. That this may be done effectually and safely, the case related by Mr. Brown proves satisfactorily. The subject of the operation was an unmarried female, 15 years old, well developed and of good constitution. An attempt had been made to form an artificial vagina, which failed in consequence of the extremely small amount of tissue to work upon. The operation per vaginam was followed, for a few days, by occasional attacks of pain, chiefly produced by the slow contraction of the uterus. Some degree of pain was due, also, to the efforts at natural menstruation. The appearance of healthy catamenia took place on the evening of the fourth day after the operation and during the next day. Pain also preceded the second menstruation for some days. There was not the slightest appearance of irritative fever. The general result of the operation is looked upon as extremely favourable.

On the *Uterine douche as a therapeutic agent*, with description of a new instrument for its application. By Dr. G. Hewitt. (pp. 27–30.)

The beneficial effects of the cold douche applied to such portions of the uterus as are accessible to its action from the vagina in several of the diseases of that organ has been long recognized. It is nevertheless true, that the uterine douche is but rarely employed by the profession at large. One reason why this is so, Dr. H. believes to be the want of a ready and efficacious mode of administering it. To employ the douche effectively an instrument is required at once portable, requiring no mechanical or other effort on the part of the patient, and admitting of the use of a large quantity of water. Such an instrument Dr. H. describes. It consists of a gum-elastic bag, capable of holding nearly a gallon of water, and of folding up when empty. From the bottom of this bag proceeds a long flexible tube. When expanded it is so maintained by a brass rod screwed in its centre. The action of this instrument depends on gravitation. All that is necessary is to place the bag a foot or two higher than the seat or couch occupied by the patient. The stopcock being opened a continuous flow of water, fast or slow, as is desired, takes place through the tube, the free end of which is inserted into the vagina.

Irrigation of the os and cervix uteri by means of this instrument, Dr. H. recommends as particularly advantageous, in cases of profuse menstruation with a lax condition of the uterine vessels, giving rise in many cases to prolapsus uteri; chronic leucorrhœa from the same cause; enlargement of the womb from defective involution after abortion or delivery—engorgement of the lips of the os uteri, associated with a hypertrophied condition of the mucous membranes, and excessive secretion of the mucous follicles of the cervix; in all cases, indeed, in which there is undue fulness of the uterine vessels, or defective tonicity of the muscular fibre generally.

On the *Thrombosis and embolia of lying-in women.* By Dr. Robert Barnes, of London. (pp. 30–53.)

By recent pathologists, many of the diseases incident to the puerperal female, are referred to certain abnormal conditions of the blood. Two of these diseases more especially form the subject of the communication before us. In the first of these the patient, at a period more or less approaching that of delivery, is seized with the faintness, intense pain in one or more of her limbs, followed by swelling, arrest of pulsation, loss of heat, gangrene, and it may be death. The morbid conditions antecedent to the sudden occurrence of such a series of severe and always dangerous phenomena, without an acquaintance with which no rational prophylaxis can be inaugurated, are yet to be developed through a carefully conducted course of clinical observations. In all the cases marked by the phenomena referred to, where a post-mortem examination has been made, blood clots have been found in the main arteries of the affected limbs.

Another class of cases are marked by sudden faintness, irregular action of the heart, distressed respiration, rapidly increasing collapse, and speedy death. In these cases it is found that the pulmonic circulation is almost exclusively concerned, and clot-obstructions are met with in the right heart and pulmonary arteries. Of the causes which give rise to this coagulation of the blood and the formation of embolia, we know little or nothing.

Dr. Barnes relates in detail a case belonging to the first class referred to, and then presents in tabular form the abstract of fifteen other cases he has met with on record. These cases offer several features of similitude as well as of apparent variation. Five were preceded by rheumatism, a disease which in the non-puerperal has been frequently found associated with embolia; in one of these cases the symptoms in the limb occurred six hours before labour. The earliest period of attack after labour was on the second day, the latest seven weeks. In eight cases indications of gangrene occurred within fourteen days. In twelve fatal cases, death ensued in from eleven days to three months. Recovery took place in two cases.

"It is clear," Dr. B. remarks, "from the history of these two cases, and from what is known of the history of aneurism and other forms of arterial obliteration, partial or complete, that a collateral circulation may, under favourable circumstances, be established; or that, if gangrene be not averted, the necrosed portion may be thrown off, life being preserved by the sacrifice of a part of the body. Indeed, it has been observed that the arteries are not always completely obstructed by the clot. A space sufficient to permit the passage of a limited stream of blood may remain open. In this circumstance, and the simultaneous extension of the collateral streams is a ground for the hope of recovery."

Death may take place in the primary stage during the commotion consequent upon the coagulation of the blood in the left heart, or so early after the transport or formation of coagula in the arteries as to anticipate the occurrence of mortification.

In two cases amputation was resorted to—in one successfully—a line of demarcation having been established.

In some of the cases there were, apparently, certain premonitory symptoms, whether of the formation of heart-clots or of their transmission into the arteries; such as dyspnœa, syncope, and irregular action of the heart. The earliest condition, recorded in the majority of cases, however, is pain in the limbs subsequently affected, and generally of the most excruciating kind. This has usually remitted when mortification appeared: pulsation ceases in the arterial trunks leading to the affected limb. In cases complicated with rheumatism signs of cardiac disease have been diagnosed.

In all the cases collected by Dr. B. one or more of the limbs were affected. In three the right arm and both legs; in one, the right arm and leg; in another, the left arm and both legs; in another, the left arm and leg; in another, the right leg; in two cases, the left leg.

The embolia may doubtless be carried to the brain, as well as to the liver, spleen, kidneys, heart, and eye

"The cases," remarks Dr. B., "may be divided as to their post-mortem appearances, into two classes:—

"1. In those in which rheumatism was an antecedent condition there have been found the effects of endocarditis; the valves of the left side of the heart

have presented wart-like excrescences. In these cases it has been presumed that the accidents of local arterial obstruction were not always, or. at least, not exclusively, due to the sudden formation of fresh coagula in the heart, but chiefly to the detachment and washing away into the arterial system of portions of the valvular vegetations."

"2. In cases not complicated with rheumatism or previous disease of the heart, there is evidence to show that blood has suddenly clotted in the cavities of the heart, that the commencement of the mischief was in the heart, and that the local obstructions were the result of the detachment and washing away into the arteries of portions of the heart clot." "In cases where pain in a limb, or other local distress has been the first thing observed, the conclusion that the coagulation did not commence in the heart would be far from certain. At the same time analogy points out that the formation of obstructing coagula in the large arteries is not impossible."

Dr. B. proceeds next to the consideration of thrombosis or embolia of the pulmonic circulating system, which is often associated with a similar affection of the systemic arterial system. In the latter the disease, as we have seen, commences in the heart; there is primary central thrombosis and secondary peripheral embolia; while in the former, which is the most frequent, there is generally primary peripheral thrombosis, secondary cardiac implication, and tertiary embolia of the pulmonary arteries.

The abstract of fourteen cases found upon record of pulmonary thrombosis or embolia is presented in tabular form, and a probable case is detailed.

In six of these cases clots existed in the crural, iliac, hypogastric, or uterine veins; signs of phlebitis or uterine inflammation had preceded, often by long intervals, the symptoms of pulmonary distress. The first or peripheral symptoms were noted from twenty-four to seventy-two hours after labour; the secondary or pulmonic in from four to upwards of twenty after labour. Death occurred in from four to twenty-eight days after labour. In eight cases attended with great precordial distress, dyspnœa, and syncope, death was more or less sudden. In these cases it was generally found that the main branches and smaller ramifications of the pulmonary artery were clogged by coagula, while blood clots were present also in the right heart. When death occurred less promptly, symptoms of pneumonia had time to develop themselves, and in these it was found that the smaller ramifications of the pulmonary artery were obstructed.

"It seems," Dr. R. thinks, "reasonable to conclude that the sequence of events in pulmonic embolia is as follows:—

"1. There is dyscrasia of the blood immediately proceeding from the puerperal process, which is favourable to the production of clots in the uterine veins and veins of the lower extremities. Imperfect contraction of the uterus, the formation of putrilage in the uterine cavity from the admission of air, which acts upon the blood and serum squeezed out of the vessels, and the remains of adherent placenta or of decidua, are often the immediate antecedent conditions of peripheral thrombosis. This process is also favoured by the retardation of the circulation in the veins of the uterus and lower extremities, resulting from pressure."

"2. Portions of the peripheral thrombi, attended no doubt, in many cases by septic matter derived from the uterus, are carried to the right heart. If the solid matters be large enough, or the septic or ichorous matters be irritating enough to cause a violent perturbation of the heart's action, and to act chemically upon the blood mass, rapid coagulation of blood in the right cavities may ensue, followed by a similar process in the larger pulmonary arteries. In such cases sudden death occurs.

"3. In cases in which either minute portions of thrombi are taken up from the peripheral veins, or where the septic or ichorous matter is less virulent, no clot may form in the right heart, but minute emboli may be carried into the finer divisions of the pulmonary artery, causing lobular pneumonia, ending in slower death, or possibly in recovery. Pure thrombosis of the venous system—that is, uncomplicated with blood dyscrasia or fever—is not often fatal. It can only become dangerous when, from some accident, portions of peripheral clots

are carried to the heart." "As far as careful dissection can show, there seems good reason to conclude that obstruction of the pulmonary arteries may occasionally arise from *primary*, sudden or gradual, formation of clots in those vessels themselves."

"4. In many of these cases some mental emotion or sudden exertion has immediately preceded, and has seemed to be the exciting cause of the cardiac and pulmonic distress. It seems to me that this association may be explained by the temporary retardation of the blood current which is occasioned, and which offers a momentary facility for the chemical action of the septic or ichorous matter upon the blood. Possibly, also, sudden exertion may favour the detachment of portions of thrombi from the systemic veins. Whatever may be the explanation adopted, it is difficult to avoid the conclusion that in some of the cases the fatal catastrophe might not have occurred had the patient been kept in a condition of mental and bodily repose."

In respect to treatment in cases of puerperal thrombosis and embolia, our main attention should be directed to prophylactic measures. Care should be taken to secure a healthy condition of the blood during pregnancy, by regular exercise in the open air, thorough cleanliness of the entire skin, a good generous diet, and occasional doses of aperient medicine. During labour care should be taken to insure the due and regular contraction of the womb, avoiding as much as possible the kneading or rather bruising process too often practised, and the irregular contraction apt to be produced by ergot. After delivery, lactation should be encouraged; nothing acts with equal efficacy in maintaining healthy contraction of the uterus, and promoting its regular involution; thus averting many puerperal disorders. The recumbent position should he enforced, all causes of mental or bodily disturbance guarded against, and a generous unirritating diet supplied.

When the disease is actually present, the same general treatment is to be continued, adding bark, stimuli, and the mineral acids, especially the nitro-hydrochloric. Dr. B. disapproves of the administration of ammonia. Amputation of the diseased limb cannot, he thinks, be safely resorted to, excepting in a very few exceptional cases—possibly, those of a post-rheumatic character.

The importance of the subject discussed by Dr. Barnes—the fulness and general excellence of his exposition of it, has induced us to present a very full analysis of his monograph on puerperal thrombosis and embolia, for which we shall receive the thanks of our readers, as but few of them can have the opportunity of consulting the paper itself.

Mr. I. Baker Brown reports the results of the *operation of ovariotomy* at the London Surgical Home, and the mode of operating (pp. 59–86). Nineteen cases are presented in tabular form, in thirteen of which the operation terminated favourably, and in six death ensued. To those who feel an interest in the subject of ovariotomy we recommend a careful perusal of the report and remarks of Dr. Brown, in connection with the discussion to which the reading of the report gave rise.

Dr. Robert Barnes presented a specimen of *an ovum in ovo* (pp. 87–89). It was an egg laid by a hen in South Wales, containing within it another perfect egg, enveloped in its own shell. The outer shell is of a dull chalky white colour, without gloss or polish, similar to the egg of the Dorking fowl; the shell of the inner egg is of a red tint, like that of the Cochin fowl and partridge. Of these double eggs the same hen has laid, at irregular intervals, nine alike in every respect, even to the colour of the shells.

T. Spencer Wells, Esq., related a *case of ovariotomy*, with a reply to a statement respecting it, made by Mr. Baker Brown at a former meeting of the Society. The case and remarks of Mr. Wells should be read in connection with Mr. Brown's paper on ovariotomy, noticed above (pp. 89, 90).

Dr. J. Hall Davis describes a very unique case of *retention of the menses after difficult labour from complete occlusion of the os uteri* (pp. 91–96). Upwards of fifteen months after delivery the menstrual flux had not reappeared. The patient had had a thick yellowish discharge from the vagina; she suffered at times from pains in the abdomen; always felt uncomfortable, dull, and heavy; was soon fatigued; could not lie on her back; driving over uneven ground was

painful to her. Nearly three months subsequently, the uterus could be felt above the pubes, enlarged to the size of a four months' gravidity. A soft, somewhat elastic prominence of the uterus was perceived at the top of the vagina, with distinct fluctuation. The bowels having been regulated, the uterus was punctured with a canulated stilet at the most salient point of this prominence, in the axis of the organ, and to the depth of a quarter of an inch. The stilet was then withdrawn and the canula passed into the uterus, when a portion of the retained catamenial fluid escaped, of the consistence of treacle, and unoffensive. To cause a freer discharge the aperture was slightly enlarged on each side with the hysterotome; six ounces of the fluid then came away, and more the next day. The aperture was maintained by leaving in it a No. 12 gum elastic catheter for two hours daily. The patient caught cold after the operation, and suffered from pain and other disagreeable symptoms; and after passing through a period of much danger, had regained her normal state, with regular menstruation, at the end of three months subsequent to the operation.

On the *nature and treatment of puerperal peritonitis*, by Joseph T. Mitchell (pp. 96–105). Among 4349 recorded cases of labour attended by Mr. Mitchell, there occurred 27 cases of well-marked puerperal peritonitis, of which in all but four the termination was favourable. Mr. M. had never encountered epidemic puerperal fever, and in no one case seen by him could he trace its origin to contagion. All the cases were treated at the patient's own residence. The treatment pursued by Mr. M. was bleeding to a greater or less extent, followed by large doses of opium; rest in the recumbent posture; with extensive counter-irritant applications (fomentations of hot water and turpentine, or sinapisms) over the entire surface of the abdomen.

The remarks of Dr. Routh upon the paper of Mr. M. made at the meeting when it was read, appear to us to be especially pertinent and correct; we therefore present them entire:—

"Dr. Routh said he should be sorry to learn that the profession had been influenced by Mr. M.'s paper to treat all cases of puerperal peritonitis by bloodletting. Casual cases met with in private practice were very different from those occurring in lying-in hospitals. There were, moreover, several varieties of the disease, the dynamic and adynamic, the contagious and non-contagious, etc. In his early career Dr. R. had seen a fearful epidemic in Vienna, where sometimes six hundred died a year. That fever was found to be non-contagious, and caused by direct inoculation of dead matter carried from the dead-house beneath the nails of the medical attendants. All kinds of treatment had occasionally succeeded—generally, however, had failed. In some examples, in which a particular kind of *facies* made its appearance, it could be surely foretold that death would occur, in spite of every treatment. In others, in which such facies was not observed, instances of recovery could be found under all kinds of treatment. The fatal cases gave indications of blood poison. Almost the first thing observed, even before the mother became seriously ill, was the sudden death of the infant with narcotic symptoms—poisoned by the breast milk. In these the effusion of false membranes and serum into the abdominal cavity was so rapid as to seem rather the result of decomposition of the blood than of inflammation. An acid state of the serum was to be noted in other examples. Bleeding in such cases was contra-indicated by all known physiological rules. As also in puerperal peritonitis, which prevailed at the same time with erysipelas. He believed that every epidemic, as well as every case, was to be studied by itself, and treated upon broad general principles, and not necessarily by bloodletting as a panacea."

Dr. Thomas Skinner presents some brief remarks on *anæsthesia in labour* (p. 116), the object of which is to show the safety with which chloroform can be employed to relieve the pains of parturition, and to exhibit a simple apparatus by which anæsthetic agents might be economically administered. In commenting upon Dr. S.'s remarks, Dr. G. Hewitt considered it important that the duration of labour in cases in which chloroform was given should be stated. He had found that chloroform sometimes exercised a most decided effect in putting a stop to the progress of labour, and that in cases where anæsthesia from other causes was most desirable.

A practical inquiry into *the properties of nitrate of silver*, with *an account of a new instrument for its use in uterine disease.* By Robert Ellis (pp. 116—128). After showing the caustic nature of the nitrate of silver, and the causes by which its action upon the living tissues as an escharotic, is limited; after enumerating, also, in brief terms the invaluable part it plays in the treatment of many affections of the uterus, whether simply as an alterative of diseased action or in the destruction of diseased tissue, and pointing out the unadaptedness of the lunar caustic of the shops, in consequence of its brittleness, for application as a decided escharotic to certain of the morbid conditions of the os uteri, Mr. Ellis proposes an improved method of casting the cylindrical pencils of nitrate of silver and a new instrument to facilitate its application. For an account of these we must refer to the paper itself.

Dr. Henry M. Mudge relates a *case of large fibrous tumour impeding delivery.* (pp. 129—133.) The tumour was attached to the external surface of the fundus uteri by a pedicle of an inch in length, which allowed it to drop into the pelvis at or before the commencement of labour. It was six and a half inches in diameter. Six small tumours were scattered over the external surface of the uterus. The large tumour consisted of fibro-cellular tissue of a dusky white colour, with irregular channels, containing a straw-coloured fluid: the whole inclosed in a capsule formed of uterine substance and fibres. The latter were so intimately blended and interlaced with the white tendinous fibres of the interior as to render any attempt at enucleation of very doubtful success, while the large vessels which permeated the pedicle would have rendered excision very dangerous. The tumour was reduced in size by first introducing a trocar in it, and subsequently enlarging the orifice thus made; it was then pushed above the brim of the pelvis, and by the aid of a blunt hook the child, of which the breech presented, was brought down. When born it had some faint signs of life, which soon became extinct. In the latter part of the day after delivery peritonitis set in, which, in seventy-two hours, terminated fatally.

The next paper is entitled "*twin (?) abortion.*" (pp. 133, 134.) Mr. J. C. Langmore exhibited two specimens. The one a fœtus of perhaps some three or four months, which was flattened, and had been dead some time before it was expelled, at the fourth catamenial period, after very slight pain. The placenta was removed three hours afterwards. The hand being introduced to remove clots brought away a second and perfect ovum of about four weeks; its membranes were healthy, and the embryo as seen through them was fresh and vascular. The circumstances of this case seemed to point to the fact of superfœtation having occurred. The specimens were referred for examination to Drs. Harley and Turner, who, in their report, presented at the next meeting of the society, gave it as their opinion that the production of the second ovum of four weeks was in all probability from superfœtation. (pp. 165—169.)

Dr. J. H. Aveling presented his *polyptrite; a new instrument for crushing* the necks of uterine polypi. (p. 135.) The instrument consists of a long hook, a slide, and a screw. The hook is to be first passed over the neck of the polypus; the slide is next to be pushed up as far as it can be made to go by the hand, and then by means of the screw the operation is completed by forcing the blunt blade of the slide into the concavity of the hook and through the neck of the polypus.

Dr. H. Cooper Rose presented a *new description of nipple shield*, and described his *plan of treating sore nipples.* (pp. 135—138.) The body of the shield is of glass, bell shaped, with a pyramidal hollow projection proceeding from its upper part and communicating with its cavity by a contracted perforated stem. Over the latter cone-shaped projection is to be simply tied a calf's teat, a piece of wash leather, or an India-rubber nipple, which when not used should be kept immersed in clean cold water. The advantages of this shield is that the cylindrical portion is sufficiently long to insure a space or vacuum between the end of the mother's nipple when fully drawn out, and the end of the shield. When this part is too short the nipple is drawn up to the top entirely filling it, the lactiferous ducts being, in consequence, blocked against the hard substance of the instrument. The diameter is, also, sufficiently large to prevent strangulation of the nipple. The shield is smooth and unyielding, to avoid friction, and

transparent, allowing the flow of milk to be observed and the position of the nipple ascertained. The substance used for the mouth-piece should resemble as much as possible the parent's nipple, and so arranged that it cannot collapse and allow the child to suck in air.

The plan of Dr. Rose is to direct the use of this shield for the first week or two, or longer if there be a tendency to tender nipples, at the same time he applies to the latter, after each time the child is nursed, a saturated alcoholic solution of gum benzoin and glycerine in equal proportions.

Mr. Henry Grace describes a curious *case of double uterus with simultaneous gestation*, and Dr. Richard Hodges one of *presentation of the right arm and shoulder, delivery by the natural powers, or spontaneous evolution.* (pp. 138—140.)

The history of four additional cases of *ovariotomy* is given by Dr. W. Tyler Smith. The disease of the ovaries was in all cases polycystic. In two of the cases both ovaries were affected, in the other two only one, the left ovary. The results were, in two cases death, in two recovery. (pp. 141—144.)

An interesting case is related by Dr. Wm. Newman, of an *enormous development of hydatids in the omentum, etc., simulating an ovarian tumour.* (pp. 169—173.) The case was one in which an absolutely correct diagnosis was next to impossible during life. The area and character of dulness on percussion, the external appearance of the abdomen, its firm, nodulated character, unaltered by the supine position, the resistance to pressure and the fluctuation presented the same characters precisely as they do in multilocular ovarian disease.

A case in which *air was expelled from the vagina* is related by Dr. George Harley. (pp. 173, 174.) The expulsion of the air was attended with a loud noise. Although odourless, the discharge caused great personal discomfort. It had existed about eighteen months, commencing at a catamenial period, and had recurred at each period to an increased extent. At the date of report there were several expulsions in the course of a few minutes. The patient is married, and the mother of three children. No communication existed between the vagina and rectum. A full-sized male catheter was introduced into the uterus with a long India-rubber tube leading from it and having a stopcock at its lower end, which latter being placed in a tumbler of water, it was found that no air escaped; but when the catheter was introduced no further than the vagina an instantaneous discharge of air took place, and soon afterwards it was found that the water from the tumbler was drawn up through the tube into the vagina. It became evident, therefore, that the vagina in this case drew in the air of the atmosphere and again expelled it by a spasmodic action. In this result the abdominal muscles were found materially to assist. Although the patient could not commence the action, yet, a few minutes after it had begun, she could continue it at will. The uterus was completely retroverted. The posterior lip of the os ulcerated. The patient's general health was not good, she having a careworn and anæmic look. Had suffered from dysentery in India.

The uterus being replaced, and a course of strong nervine tonics entered upon, with astringent vaginal injections, the spasmodic action of the vagina was completely arrested by the end of two or three weeks.

A case of *imperforate rectum, with unsuccessful attempt at relief by operation*, is related by Dr. Wm. T. Fox. (pp. 195—197.) The patient was a male child four days old. Had a small but normal looking anus into which a probe could be introduced, and one-eighth of an inch beyond. A trocar was passed into the anus and carried in the direction of the rectum for about an inch and a half. No good resulted, and the patient soon after died. Upon dissection it was found that the rectum terminated in a cul-de-sac about an inch and a half from the anus, with which it was connected by cellular tissue.

A very interesting case of *rupture of the vagina during labour* is related by Dr. Jno. H. Bell. (pp. 197—202.) The child had escaped into the abdomen, where it remained three and a half hours before it was delivered by turning. The body was born promptly and without difficulty, but before the head came away considerable time and force were required. The placenta was readily delivered by the hand, but whether from the cavity of the uterus or abdomen could

not be ascertained. No untoward or very severe symptoms occurred, and in less than three months from the accident the patient was entirely well.

A very singular case of *unsuspected pregnancy* is related by Dr. Jno. Shortt. (pp. 202—204.) It was the patient's third pregnancy; during the greater part of which she had been treated for obstinate costiveness, and supposed displacement and inflammation of the womb. In the latter period of gestation the intumescence of the abdomen was mistaken for ovarian disease. When the membranes became accidentally ruptured, two days before delivery, it was supposed that an ovarian cyst had given way. When the pains of labour set in a surgeon was called, who pronounced the case to be one of rupture of an ovarian cyst into the abdominal cavity. An opiate draught, etc., was ordered, and the patient placed in a warm bath, when, to the surprise of all parties, a living child escaped into the bath, and would have been drowned but for the presence of mind of an assistant. The child was a boy, at maturity, well proportioned, of average size, but of rather lanky appearance and pigeon-breasted.

The patient, although twice a mother before, appears to have been entirely ignorant throughout of her pregnancy; all her feelings she attributed to disease. The birth of a son was, as she declared, "the greatest surprise she ever experienced." Another remarkable feature in this case was that for almost two-thirds of the period of gestation the speculum, caustic, &c., had been applied to the os uteri, and the most drastic purgatives administered without any injurious effects.

Dr. Thomas H. Tanner comments on *the use of medicated pessaries in the treatment of uterine disease.* (pp. 205—208.) "There are few uterine diseases," he remarks, "in which the use of medicated pessaries may not advantageously form a part of the treatment. But they are more especially valuable in acute and chronic inflammation of the cervix uteri, in internal metritis, with exfoliation of the lining membrane of the uterus, in slight prolapsus or procidentia, in cancer, in all varieties of ovaritis, as well as in many affections of the female bladder. By means of them the diseased parts may be kept constantly bathed in such drugs as mercury, iodine, lead, zinc, belladonna, opium, conium, &c. They are not only most efficacious in relieving pain, but they also shield the diseased and irritable surface from contact with the vaginal walls. Owing to this latter property they are of great utility in healing excoriations about the labia uteri, though, of course, part of the benefit derived from their use in these cases must be attributed to the absorption of the materials composing them. By their employment, moreover, the necessity for frequent examination of the morbid structures is greatly diminished.

Dr. Tanner presents some six formulæ for medicated pessaries adapted to different forms of uterine disease.

A case of *sudden and unconscious delivery* is reported by Dr. Jno. Shortt. (p. 210.) The patient was a Hindoo of caste. Whilst walking with two companions, carrying, all three, loaded baskets on their heads, she suddenly, without any preceding pain or other premonition, felt her child slip between her thighs to the ground; the after-birth came away soon after. The patient was in good health, twenty-eight years old, and the mother of two living children. She knew herself to be pregnant, but did not expect to be confined for some days.

A case of *obstructed labour from the presence of the hymen* in a patient thirty-one years of age is related by Dr. S. Palmer. (pp. 211, 212.) The hymen was of the type of what may be termed fenestrated. That is, having a central band extending from beneath the meatus urinarius to the fourchette, bounded on each side by a perforation or opening. On the left side the margin of the central band was smooth and rounded, while on the right it was fringed. The central band being divided with a pair of scissors, almost immediately after the child's head passed into the world. The scalp was greatly tumefied, and there was a deep sulcus where the band had pressed which did not disappear for ten days.

Case of *acephalo-cyclopean monstrosity.* By Mr. R. Hardey. (pp. 213–21.) The most remarkable features in the case of this monster, was the entire absence of a head, while the rounded and somewhat protuberant termination of the upper portion of the chest presented a face of which the cheeks and mouth were directed upwards. The face was of full size, mouth unusually round, with

a protruding tongue very thick and firm. The cheeks were large, protuberant, and livid—no doubt from long continued pressure during labour. Chin scarcely discernible, but situated at the usual distance from the mouth. Nose entirely wanting. From the centre of the upper lip there ran posteriorly a sulcus, separating the cheeks, and terminating at the central, pointed margin of a rounded cavity, measuring $1\frac{3}{8}$ inch from before backwards, and about $1\frac{1}{4}$ inch across. This cavity, surrounded by a ciliary margin and a few cilia, contained a large globe, possessing *two pupils*, one on each side of the mesial line. The eye itself was protruded forward. The monster was born dead.

Mr. Hardy remarks that his experience, founded upon nearly 6500 cases of labour attended by him during the last forty years, "is in direct opposition to the prevalent opinion that monstrosity in the fœtus is traceable, in a large number of cases, to strong impressions made on the mother's mind during early gestation"—the child when born being marked in the way anticipated by the mother.

The volume contains the history of another *case of monstrosity*, described by Dr. A. Meadows. (pp. 255–59.) The child in this case, which appeared to have arrived at the seventh month, instead of possessing the usual organs of locomotion had at the lower extremity of the body a pointed caudal appendage measuring about $5\frac{1}{2}$ inches from the extremity of the spine.

Dr. A. Hall relates a case of *puerperal convulsions complicated with mania*. (pp. 222–23.) In this case, after apparent recovery, death suddenly ensued.

Dr. J. Braxton Hicks relates five cases of *vaginal closure*. (pp. 228–42.) The first was a case of entire absence of the vaginia (*atresia*) with retained menses, in a girl, 18 years of age: the uterus was punctured through the rectum. The operation was successful: but as there was no menstrual discharge for the ensuing seven months, and for the relief of the intense pain under which the patient suffered, the operation was repeated; after which she menstruated regularly per rectum without pain or inconvenience.

The second case was that of a married woman, 28 years of age. There was complete *atresia of the vagina*. The formation of an artificial vagina was attempted. The patient refused to submit to the completion of the operation.

The third case was one of *excessive dysmenorrhœa from almost complete occlusion of the vagina*, occurring in a married woman, 25 years of age. The occlusion was the result of cicatrices, which were carefully divided by the bistoury, and subsequently a large bougie was introduced into the vagina and constantly worn by the patient. The operation was completely and permanently successful.

The fourth case was one of *almost entire obliteration of the middle third of the vagina*, with conversion of the upper third into a large sac distended with pus. The patient was in the seventh month of her second pregnancy, which occurred seven months after her previous delivery. Pains, at intervals, had set in for three or four days. The vaginia was opened by the knife, and a cavity penetrated, from which were discharged some four or five ounces of pus. The next day but one she gave birth to a dead child. The recovery was complete with patulous vagina, in which a bougie had been constantly worn.

In the fifth case the *middle third of the vagina was contracted to the size of a quill*, in a woman in labour with her second child. The cicatrices in the vagina were divided by the knife. The child being dead, its head, which was firmly impacted in the brim, was perforated, and with much trouble delivered. Recovery was speedy, and two years subsequently the patient was delivered of a dead child, without any trouble.

Dr. Thos. H. Tanner relates a case in which there occurred the somewhat unusual *complication of multiple medullary cancer with pregnancy*. (pp. 243—50.) The patient was about five months advanced in her third pregnancy. Premature delivery was determined upon to increase the woman's comfort, and from the fact that, as the vagina was already nearly blocked up with a cancerous growth, the birth of the child at the full time would be impossible. The fœtus could only be removed piecemeal after being broken up. At the end of some twenty-six days after the operation, the patient died from extreme exhaustion.

The history of this case confirms the general opinion that the existence of cancer does not interfere with a woman's fertility.

Case of *retention of the catamenia* for more than two years, in a married woman; by W. Chapman. (pp. 251–55.) For upwards of two years after having undergone a second operation for vesico-vaginal fistula the patient had not menstruated. At the end of that time she was able to superintend her domestic affairs, to walk out, attend church, and to a casual observer, presented the aspect of health. She complained of great irritability of bladder and stomach, frequent vomiting, and pain in the lower part of back. On examination of the abdomen externally, the existence of a large tumour, resembling the uterus at about the sixth month of pregnancy, was revealed. A vaginal examination showed the cervix uteri to be lost in a general enlargement of the uterus, but no os could be discovered, a thin membrane being detected by the finger in its stead. The speculum showed that the os was hermetically sealed. Soon after the cessation of her menses the patient had suffered more or less distress, which was augmented to severe pain and spasms at every monthly period; on which occasion she had occasionally a copious whitish inoffensive discharge. The diagnosis was retention of catamenia from a closure of the uterine orifice. On this being re-established, by scratching through the membrane existing where its site should have been, until an opening was made large enough to admit the tip of the finger, there was immediately a copious flow of some ten or twelve ounces of a thick fluid of a dark claret colour, and free from all unpleasant odour. Three days after the operation, after improper exertion and exposure, the patient was attacked with severe pain of the abdomen, tympanitis, sickness, small and rapid pulse. A full dose of opium and calomel speedily relieved her, and soon after her bowels were freely opened. In the ensuing week, the discharge from the uterus having become thin and offensive, a full sized elastic male catheter was introduced, through which the uterus was washed out with tepid water, almost daily.

For ten days after the operation the patient seemed to be doing very well. On the eleventh it was ascertained that she had been very sick during the preceding night; could retain no nourishment: her countenance was pale and shrunken, her hands cold and damp. No pulse could be felt at the wrist. Brandy and water was administered. She recognized, and spoke to her friends around her. She continued to sink rapidly, and in a few hours was a corpse. She remained sensible to the last. A post-mortem examination could not be obtained.

In the concluding communication of these transactions, Dr. W. Tilbury Fox discusses the question as to the *influence of the mother's health in the production of rickets* (pp. 260–75).

From the facts adduced by Dr. Fox in the communication before us, there can be little doubt that rickets may be produced in the infant by any marked deterioration of the mother's milk when this is made its sole nourishment. The same would seem to prove also that profuse or regular menstrual discharges taking place during lactation is a prominent cause of an impaired lacteal secretion. But we cannot go so far as Dr. F., and pronounce the occurrence of menstruation during lactation to be the only cause of deterioration in the milk of the mother or nurse, nor do we believe that the facts adduced by him warrant such a conclusion. Nor can we agree with him, as he would seem to teach, that the impaired quality of the breast-milk upon which the sucking infant is exclusively nourished, is the chief if not the only cause of rickets. It is no doubt, in many cases, a very powerful co-operating cause, but facts which cannot be gainsaid seem to prove, incontestably, that among the causes of the rachitic condition, are exposure to a stagnant, impure, raw, damp and cloudy atmosphere, badly ventilated, damp, dark, and unclean dwellings, defective clothing, personal uncleanliness, long-continued quietude in the recumbent posture, want of sufficient and appropriate food, and intemperate and other vicious habits on the part of the mother.

D. F. C.

ART. XXII.—*The Principles and Practice of Ophthalmic Medicine and Surgery.* By T. WHARTON JONES, Professor of Ophthalmic Medicine and Surgery in University College, London, Ophthalmic Surgeon to the Hospital, etc. With one hundred and seventeen Illustrations. Third and Revised American Edition, with Additions from the Second London Edition. Philadelphia: Blanchard & Lea, 1863. 8vo. pp. 455.

WE have always regarded the well-known manual of Mr. Jones as one of the best of the condensed works on ophthalmic medicine and surgery. There is scarcely anything pertaining to this important branch of the healing art which is not touched upon and practically elucidated.

Great advances have been made in ophthalmology within a few years, especially by the Germans; and with characteristic—and it may be commendable—slowness the English are following, and probably will claim originality in most of the procedures that may become *established* facts.

In the body of Mr. Jones' work we find very little regard paid to these "new lights," but the editor "has bestowed much labour in bringing the work up to the present state of knowledge in the department of which it treats." In this effort he has made many valuable additions, nearly all having a practical bearing, such as remarks upon the ophthalmoscope, upon iridectomy in glaucoma, upon strabismus, and particularly upon the surgery of the appendages.

The introduction of the test-type corresponding with *Jaeger's Schriftscalen* is also a good feature, and due notice is taken of American contributions to the science.

As this work professes to be eminently practical, there are some further additions which might be suggested and which may be incorporated in future editions. For example: We find but slight notice of the sulphate of atropia, which is so much more elegant a preparation than the extract of belladonna. In looking over some two hundred pages we found the word atropia only twice. In iritis it is not alluded to at all, the remark "Besides belladonna to oppose the contraction of the pupil," &c., occurring in the article on syphilitic iritis in such a way as not to attract sufficient attention. Now, what is more important to the ophthalmic practitioner than his atropia bottle? Many do and all ought to carry it in their pockets.

We would sooner dispense with mercury than atropia in iritis, and it is certainly invaluable in diagnosis. The only cases in which we have thought that it does temporary harm is precisely where it is often recommended and incautiously used; that is, as an antecedent to ophthalmoscopic examination. If there be no positive reason for using it here, it should not be done, and the most skilful examiners, we believe, profess to reject it altogether for this purpose. We have no doubt that many of the charges at first laid to the ophthalmoscope were due to atropia, on account of serious effects sometimes produced by the great volume of artificial and brilliant light thrown upon the retina through a dilated pupil.

Mention might also have been made of the modification of extraction that has of late been practised; that is, the combination of iridectomy with it in certain cases, and the removal of the lens with the flattened spoon. This instrument is now regarded with great favour by many operators; in fact, we have seen many cases where a large incision and pressure were not applicable, in which, by the use of the spoon the operator was enabled to lift out the hard nucleus of a cataract, through a comparatively small corneal incision, with no injurious disturbance whatever. This spoon can scarcely be called a modification of Daviel's scoop, as it is altogether different in shape and may be applied to different uses.

The Glossary at the end of the book has been revised and enlarged with great care, and is a complete dictionary of the hard terms used in ophthalmic science.

This edition is particularly well printed. The scale of test-type we regard as a model of typographic art. W. H.

ART. XXIII.—*Outline of a New Theory of Muscular Action:* being a Thesis read for the degree of Doctor in Medicine, before the University of Dublin, Dec. 17, 1862. By the Rev. SAMUEL HAUGHTON, M. D., F. R. S., Fellow of Trinity College, Dublin. Williams and Norgate: London, 1863. 8vo. pp. 23.

THE contents of this physiological brochure scarcely warrant its aspiring title. After a careful perusal of its pages, we have been unable to discover that any theory whatever of muscular action is ennunciated therein. It consists, on the contrary, of a series of interesting mathematical speculations on the rate of muscular contraction, and the amount of work which the muscles, and especially the heart, are capable of performing in a given time.

It has long been known that muscles in a state of contraction produce sound. In the Croonian lecture, read in 1809 before the Royal Society, Dr. Wollaston endeavoured to show that the greatest frequency of the elementary muscular contraction that produces this sound or susurrus was about 35 or 36 in a second, and the least was as low as 14 or 15. In general, these contractions were between 20 and 30 in a second. Dr. Wolloston thought it possible that the method he employed might be found defective, and expressed the hope that his estimate might be corrected by some means better adapted to the determination of intervals that cannot actually be measured.

Dr. Haughton thinks that an accidental observation made upon himself has enabled him to fix, with the precision desired by Wallaston, the rate of the muscular contraction that causes the susurrus. After recovering from a slight attack of fever, he was occasionally troubled witn tinnitus aurium, which was sometimes so great as to prevent sleep. One night, to his surprise, he discovered that the tinnitus was in unison with the susurrus, produced by contraction of the masseter muscles, though differing from the latter by several octaves. The musical note of the susurrus appeared to him to be CCC, or two octaves below bass C; that of the tinnitus coincided with the octave above treble C; or, in other words, it was five octaves above the susurrus, and therefore corresponding to a rate of vibration thirty-two times faster than that of the muscle, or 1024 times in the second.

Dr. Haughton thinks that the tinnitus is altogether independent of muscular or voluntary action of any kind, and is a sign of the rate at which nervous action takes place in the brain.

The rate at which muscular contraction takes place, is between 32 and 36 vibrations per second.

Dr. Haughton found that the supra-spinatus and deltoid muscles were capable, in each of his shoulders, of performing an amount of work equivalent to raising 1083 lbs. through a foot, before they became exhausted. In a friend of his he found that these muscles were capable of exerting a degree of power equal to 1185 foot pounds. Taking the mean of these two observations, he found that the supra-spinati and central portion of the deltoids of both sides are capable of lifting 2268 lbs. through one foot before they become exhausted—that is to say, very nearly one ton lifted through one foot. As the weight of the muscles on both sides, engaged in the act of holding up the arms exactly in the horizontal position, is $10\frac{1}{4}$ oz., or 4485 grains, it follows, by an easy calculation, that 1 lb. weight of the same kind of muscle is capable of lifting 1.56 ton through one foot.

The third part of this little monograph contains some interesting calculations as to the amount of work done by the heart in a day.

"If the heart were an ordinary muscle, it would lift 0.9275 of a ton through a foot in $7\frac{1}{2}$ minutes, and then become incapable of doing more work for some time. As the heart, however, never tires, it accomplishes this amount of work in $7\frac{1}{2}$ minutes, and eight times this work in one hour; therefore in twenty-four hours, the

"Work done by heart$=0.9275\times8\times24=178.09$ ft. tons.

"During each double beat of the heart, reckoned as 10 parts of time, seven

parts are occupied by a muscular contraction of the ventricles or auricles, and three parts are not employed in doing mechanical work. Reducing, therefore, the work just calculated to $\frac{7}{10}$ths of its amount, I find the

"Daily work of the heart=124.6 ft. tons." J. A. M.

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Art. XXIV.—*Test-Types for the Determination of the Acuteness of Vision.* By H. Snellen, M. D., Surgeon to the Netherlands Ophthalmic Hospital at Utrecht. Printed by P. W. Van de Weijer, Utrecht, 1862. 8vo. pp. 6, with fourteen sheets of tables.

This is the fullest and most complete series of test-types for the determination of the degree of vision possessed by patients that we have met with. It comprises letters of the smallest size, or of from only 0.209 Paris lines, to those of 41.886 lines, or of about three and a-half inches. Besides these, we have black letters on a white ground and white letters on a black ground. It contains, also, coloured letters to furnish means of ascertaining the acuteness of vision for the different colours of the spectrum.

Finally horizontal and vertical lines of equal thickness are given, and small black squares to enable us to detect astigmatism. It would have been an additional aid to us in determining this defect had a large circle and also a large square each with thick lines been given. To those affected with astigmatism the circle would appear oval, and the direction in which the circle appeared elongated would assist the optician in arranging the plano-cylindrical lens for the correction of this defect.

These tables are far more extensive than the *Schriftscalen* of Jaeger, and every ophthalmic surgeon and optician should possess a copy of it. They will find it to aid them greatly in their investigations into the acuteness of vision of their clients, and they will also be promoting a benevolent object, as the work is sold for the benefit of the Netherlands Ophthalmic Hospital.

# QUARTERLY SUMMARY

OF THE

# IMPROVEMENTS AND DISCOVERIES

IN THE

# MEDICAL SCIENCES.

## ANATOMY AND PHYSIOLOGY.

1. *Sterility in Man.*—MR. T. B. CURLING read a paper on this subject before the Royal Medical and Chirurgical Society (June 23, 1863). The object of the communication was to show that a want of aptitude to impregnate may coexist with the capacity for sexual intercourse, or, in other words, that man is subject to sterility independently of virility. The author states that sterility in man may arise from the following causes: 1. Malposition of the testicles. 2. Obstructions in the excretory ducts of the testicles. 3. Impediments to the escape of the seminal fluid. 1. *Sterility from malposition of the testicles.*—The author remarks that the opinion of John Hunter, "that when one or both testicles remain through life in the belly they are exceedingly imperfect, and probably incapable of performing their natural functions," is corroborated in a remarkable manner by the facts adduced in this paper. After describing the condition of detained testicles, the author states that the question to be considered is, whether a testicle that has not passed into the scrotum can secrete a fertilizing fluid. He assumes, as quite established, that to possess this property the semen must contain zoosperms. Having referred to the observations of Professor Goubaux on horses, and to those of Follin and Godard on man, the author remarks that the proofs adduced by these observers were not sufficiently cogent and numerous to establish the law that cryptorchics are infertile; and it could not be expected that assent should be given to results so remarkable and unexpected without evidence of the most convincing character. Opposite opinions continue to be entertained, and have recently been avowed by Dr. Alfred Taylor. The author gives the particulars of two cases of double detained testicle in married men (cryptorchics) without children; and also two cases of single detained testicle, the second testicle, in one case, being completely atrophied, and in other having been removed by operation. In all four cases the copulative powers were satisfactory; but the ejaculated semen was destitute of spermatozoa. The author gives a table, which includes these four cases and five others, three described by Godard, one by Puech, and one by the President of the Society, making nine in all, in which the fluid ejaculated by men with retained testicles was submitted to examination and found to be destitute of spermatozoa. In confirmation of the results obtained in these cases, he deduces some observations made upon the lower animals by Messrs. Goubaux, Follin, and Godard; and he furnishes a table of eight cases in which the fluid found after death in the substance of a retained testicle—in the epididymis or vas deferens, or in the vesicula seminalis on the side corresponding to the misplaced gland—had been examined and found destitute of spermatozoa. They have not been discovered after death in the spermatic ways of a detained testicle in any one instance that he knows of. The facts which have been brought forward as opposed to the conclusion that cryptorchics are sterile, are chiefly instances in which they are reputed to have pro-

created children. Three cases are cited: one recorded by Mr. Poland, another communicated by Mr. Cock, and a third by Mr. Durham. The author feels no little hesitation in calling in question the claims to paternity in these cases; but remarks that as yet no case has been found in which a retained testicle has been fully proved to be capable of secreting a fertilizing fluid. The observations collected in the paper seem sufficient to show that, as a rule, they do not; and though he sees no valid reason why there should not be exceptions, still the evidence is wanting to establish the exception in either of the instances of reputed paternity which have been mentioned. 2. *Sterility from obstructions in the excretory ducts of the testicle.*—After giving a brief account of Gosselin's researches, in which he showed that after attacks of gonorrhœal epididymitis the channel for the semen is temporarily and sometimes even permanently obstructed, causing, when the epididymitis is double, sterility, the author relates three cases occurring in his own practice of permanent obstruction in the epididymis of both testicles in married men whose wives were barren. In all three the patients had vigorous powers, but there was a total absence of spermatozoa in the ejaculated fluid. The author insists on the importance of careful and prolonged treatment in cases of epididymitis to obtain the removal of inflammatory effusions. The author remarks, that the passage of the semen from the testicle may be prevented by congenital absence of the vas deferens, which, if double, would occasion sterility. A case of the kind, in which the testicles were sound, had been observed by John Hunter. The excretory duct of the testicle is liable also to be interrupted by tubercular deposits in the epididymis. It is well ascertained that this part is much more frequently the seat of tubercle than the body of the gland, and is often extensively diseased, whilst the substance of the testicle remains sound. The author gives a case in point, in which the semen was destitute of spermatozoa. 3. *Sterility from impediments to the escape of the seminal fluid.*—It is well known that a close stricture in the urethra so completely interrupts the passage of the seminal fluid that in ejaculation it regurgitates into the bladder, where it mixes with the urine. In erection of the penis the urethra becomes narrowed, so that a stricture which offers but a slight obstacle to the flow of urine may, under congestion, be sufficient to impede the emission of semen. The author has grounds for concluding that sterility from chronic stricture in the urethra exists to a greater extent than is commonly supposed. As the condition is one which is, in most cases, remediable, it is only necessary to call particular attention to it as not an uncommon source of infertility. The author alludes also to a case in which he had reason to conclude that sterility was consequent upon inflammation and abscesses near the prostate gland, occasioning obliteration of the ejaculatory canals. Two important and delicate questions arise out of these inquiries. 1. Whether a man who has the inclination and power to copulate, but who is nevertheless sterile, is justified in contracting marriage. 2. Whether this condition is a sufficient ground for divorce. That a man who is unable to fulfil the command, "to be fruitful and multiply," is right in disappointing the hopes and periling the happiness and perhaps health of a woman, cannot, the author thinks, be maintained by any casuist, and in some of the cases related in the paper he has felt it his duty to give advice in accordance with this opinion. It cannot be doubted that in women ready for conception, frequent sexual excitement without impregnation is very likely to prove injurious to health, and the author shows from the writings of Dr. West, that diseases of the ovaries and uterus originate from this cause. The second question is one upon which a surgeon is scarcely called upon to pronounce an opinion. But the author ventures to remark that as sterility in women is not considered an adequate cause for divorce, so the man ought not to pay such a penalty for unsuspected unfruitfulness.

The President then related several cases bearing on the paper. A gentleman, aged 31, had been married eight years to a healthy wife. He had strong sexual desire, and frequent intercourse, with abundant emission, but no family. He died of tumour in the groin, which was found after death to have been due to encephaloid disease of a retained testis. The other testis, which was also retained, was of the natural size, but did not contain any spermatozoa. Unfortunately the disease had extended to the bladder, so that the condition of the vesi-

culæ seminales could not be made out. In a second case, not under his (the President's) observation, a gentleman whose testes were retained, and who had frequent intercourse with his wife, ejaculated a transparent fluid, but it did not contain spermatozoa. A gentleman, 34 years of age, whose testes were undescended, had frequent sexual intercourse and free emissions, but the fluid, which was examined four times, did not contain spermatozoa. This gentleman was desirous of knowing if he ought to get married. The President told him that if he did he would have no children. In a fourth case, one testis was misplaced in the perineum, the other was normal. He (the President) tried by an operation to bring it to its natural position, but did not succeed. He subsequently removed it. It did not contain any spermatozoa.

Dr. Webster said the subject discussed by the author of the paper just read was of much interest, and he believed with him that sterility oftener depended upon males than females. In support of such an opinion, he would refer to nearly 300 married men within his own acquaintance who, during their matrimonial state, never begot any offspring, excepting one instance, where a child was born after the mother had remained barren during fifteen years. In the list kept by Dr. Webster no person was entered until the parties had lived together for at least five years; and although he never investigated the matter so scientifically as Mr. Curling, there appeared little doubt the fault mainly depended upon the male, since various females who continued childless throughout their first marriage, on contracting a second became mothers; whereas there only occurred, in reference to the opposite sex, the solitary example already mentioned. It might, however, be added as curious, that a large proportion of the sterile individuals Dr. Webster had thus recorded were Medical Practitioners; and, moreover, what seemed also rather singular, seven of these couples lived in a thoroughfare having the same designation, but with different numbers on their respective residences. Regarding the chief cause of barrenness in the various illustrations to which Dr. Webster referred as coming under his immediate observation, none having been patients, it was impossible to speak definitely; nevertheless, as analogous cases are not uncommon, the inquiry mooted by Mr. Curling was therefore important, both medically and in its social relations, besides bearing specially on questions of jurisprudence.

2. *On the Amyloid Substance of the Liver.*—One of the most important physiological papers contributed for some time to the Royal Society is one written upon the above subject by Dr. R. McDonnell (Dublin). We think it necessary also to give a slight sketch of one by the same author, to which the present one is a sequence. The first paper[1] was read before the Royal Irish Academy, 1860.

The amyloid substance was described in 1857 by Professor Bernard, before the Académie des Sciences, under the name of glucogenic matter. Hensen also, independently of Bernard, discovered this substance. Bernard's view of this compound was, that the liver only formed it with the object of its ultimate transformation into sugar. Hence, he named it glucogenic matter. The following were the questions open to investigation at the time that Dr. McDonnell wrote his first paper:—

1. Has the liver the power of forming the amyloid substance from azotized compounds?
2. Is the liver endowed with the function of converting it into sugar during life and health?
3. Has the liver the exclusive privilege of forming it, or is it met with in other tissues and organs?

The amyloid substance of Bernard is a compound isomeric with dried grape sugar. It is neutral, whitish, inodorous, insipid, soluble in water, insoluble in alcohol and strong acetic acid. In the presence of saliva or other animal ferments it is converted into sugar. Iodine in contact with it produces a peculiar brown colour, disappearing on the application of heat, and reappearing when the fluid cools to 80°. This reaction is very beautiful and decided.

[1] For a notice of this paper see this Journal for Jan. 1862, p. 214.

Dr. Mc Donnell objects to M. Bernard's process for preparing this substance, as he states that the product is likely to be contaminated with gelatine and casein. The author proposes the following process as more likely to yield a pure product: The tissue while still raw is pounded in a mortar with animal charcoal, boiled with a small quantity of distilled water, and the whole thrown upon a filter. The filtrate is then allowed to drop into glacial acetic acid. The amyloid substance being insoluble in that menstruum, falls as an abundant white precipitate. The first query propounded, viz: "Has the liver the power of forming the amyloid substance from azotized compounds? is treated in the following manner: In his experiments, the author found that bitches and cats, fed exclusively upon meat, continued to form milk containing sugar. It is argued, nevertheless, that the amylaceous and saccharine matters enter from without, *i. e.*, that the herbivora find the amylaceous principle in vegetables, that accumulates in *their* tissues, and through this channel enters the organism of the carnivora." Dr. McDonnell argues that such is not the case, because mutton or beef does not give any precipitate of the amyloid substance when treated by the acetic acid process. In answer to the two last questions the author replies in the negative.

"It seems to me that the amyloid substance is on its way to a more exalted or complex immediate animal principle, and that its conversion into sugar is a deviation from its progressive course."

After detailing some experiments which warrant this assumption, he goes on to say:—

"Hence one seems, in some degree, justified in concluding, that in vegetable-eating animals the blood is normally saccharine, but the liver does not appear during life to form and pour out into the blood of the hepatic vessels, sugar specially derived from the transformation of the amyloid substance into that material.

"The existence of the amyloid substance in other organs and tissues is rendered evident by the following facts:—

"The amyloid substance is abundant in the liver, &c. It is found in the placenta most plentiful about the third and fourth months of utero-gestation. It exists in the lungs and muscles of the fœtus, as well as in the epithelial cells of the skin, respiratory and digestive organs, amounting sometimes to fifty per cent. It exists in the cartilage of the embryo of the chick. It is met with in muscles paralyzed in consequence of section of their motor nerves."

The author having arrived, by a repetition of Dr. Pavay's ingenious experiments, at the conclusion that the amyloid substance of the liver is not normally changed into glucose, the following question presents itself: May it not be that the liver does for the adult what divers tissues do during the development of the fœtus? *id est*, may not the liver form, with the help of the amyloid substance secreted in its cells, a nitrogenous compound, just as the muscle of the fœtus converts the amyloid substance contained in them into the highly nitrogeneous material of muscular tissue? For Dr. McDonnell's remarks, in a previous part of his paper, that the presence of the animal dextrine, in placentæ of rabbits, &c., and also in amnion, as noticed by Bernard and others, is quite a secondary matter, to the fact that he has demonstrated, which is, that this animal dextrine enters largely into the constitution of most of the tissues of the embryo. During embryonic life a great part of the fœtal tissues are found to be so impregnated with the amyloid substance, that it appears to be the formative material from which these tissues are evolved. Therefore, to sum up in the words of the author, the ultimate destination of the amyloid substance in the animal economy, seems to be to take to itself nitrogen, it being itself a protoplasma, which, by becoming azotized, terminates in the evolution of fully-formed nitrogeneous tissues. It is on its way upwards, towards the more exalted or complex immediate animal principles; in fact, the process of healthy assimilation tends, if the expression may be used, to promote it from the rank of ternary (non-azotized) to that of quaternary (azotized) compounds, and that its conversion into sugar is to be looked upon as a deviation from its progressive course—a dissimilative instead of an assimilative process.—*Dublin Med. Press*, Aug. 26, 1863.

3. *Fibrine, and the Causes of its Coagulation.*—SCHMIDT's very interesting researches show that it is principally the cells which contain the active principle in the process of coagulation. Lymph and chyle do not possess the property of spontaneous coagulation before their admixture with cells, which takes place in the lymphatic glands. But if cells are artificially added to pure lymph and chyle, coagulation begins at once. The difference in the appearance of fibrinous coagula was found to depend, not on a variety of fibrinous substances, but on the difference of the cells which produce the coagulation. Serous effusions coagulated when to their clear fluid a small quantity of defibrinated blood was added. The action of the active principle is not analogous to that of ferments, for it is used up in the process. It combines chemically with the coagulable substance. Schmidt calls those substances which have the power of inducing certain albuminous fluids to coagulate, *fibrinoplastic*. Among these are especially blood-lymph, chyle, and pus-corpuscles; but also the cornea, the watery extract of the crystalline lens, the humours of the eye, saliva, &c. The fluids which contain the coagulable principle in solution he names *fibrinogenous*. The fibrinoplastic properties he further shows to depend on a substance which is identical with hæmato-globuline. As regards the influence which the gases of the blood exert upon its coagulation, he makes out that the presence of carbonic acid always retarded coagulation. This retarding influence is but very slight when exerted on fresh blood. He thinks that the differences in time which arterial and venous blood show in reference to coagulation may be accounted for by the different amounts of carbonic acid which they respectively contain. Oxygen and atmospheric air he found to have no direct influence in promoting coagulation; but when much carbonic acid is contained in the blood, oxygen promotes coagulation by displacing that gas. Blood which in vacuo had been freed of all its gases did not lose its fibrinoplastic power. Contact with animal tissues retards coagulation.—*Brit. and For. Chir. Rev.*, July, 1863, from *Archiv für Anat. Phys.*, *&c.*, 1861.

4. *Effects of Suppressed Action of Skin.*—EDENHUIZEN has performed some experiments on rabbits, sheep, a dog, and other animals, for the purpose of ascertaining what changes take place in the organism when the action of the skin is suppressed. When one-eighth to one-sixth of the skin of an animal was covered with glue, oil-colour, varnish, gum, tar, &c., it was sure to die of the effects. Edenhuizen concludes from his researches that in the healthy state a small quantity of nitrogen in a gaseous form is given off by the skin, and that, this function being suppressed, the nitrogen is retained in the blood in the form of ammonia, which is then deposited as triple-phosphate in the subcutaneous areolar tissue and in the peritoneum. The nitrogenous compound retained in the blood acts as an irritant to the nervous system, producing rigors, palsies, cramps, and tetanic attacks.—*Ibid.*

5. *New Source of Oxygen for the Animal Organism.*—At a recent meeting of the Munich Academy of Sciences, Baron LIEBIG announced what he considered as a very important discovery. The atmospheric air has hitherto been regarded as the chief or only source of the oxygen employed in the processes of nutrition and metamorphosis within the animal organism. By the aid of an apparatus, for which King Max provided 7000 florins from his private purse, it has now been shown that, within the bodies of carnivora, a very considerable amount of oxygen is produced from water; and that, under given circumstances, a powerful process of decomposition is set up, resolving the water into its constituent parts, its oxygen serving for the formation of carbonic acid, and the hydrogen (which often exceeds the volume of the animal in quantity) being discharged by expiration.—*Med. Times.*

6. *Effects of Compressed Air on the Animal Economy.*—During the building of the new bridge at Kehl, the labourers had to work in compressed air. BUCQUOY made observations of the effects of that air upon himself and others. He found that, in getting into the reservoir, the respiration lost its regularity. Restlessness was soon felt, and pain in the ears set in. It was as if a foreign body was

driven with force into the external meatus. This pain was so intense that some people could not help crying. After a while it went off, then came back again, till it at last entirely ceased. The breathing grew also quiet; the inspiration was shorter than usual; the expiration longer; the pulse was more frequent than normal; hearing was impaired, and it felt as if an expanding body was lodged in the interior of the ear. The voice sounded as if it came through the nose, and it required an effort to speak out. At 2½ atmospheric pressure it was impossible to whistle, and there was much perspiration. On returning into the open air, the breath formed a cloud; there was a sharp feeling of cold; the pain in the ears returned; there was palpitation of the heart; and the respiration got again irregular. On analyzing the air, it was found to contain 2.37 per cent. of carbonic acid; the remainder consisted of 19.23 per cent. of oxygen, and 80.77 per cent. of nitrogen. Those who had to work for a long time in the compressed air became emaciated. Many labourers lost their appetite, and looked as if they were just recovering from a severe illness. Muscular and rheumatic pains often occurred, and sometimes the effects of congestion of the lungs and of the brain were observed. The blood which was taken from veins presented, in some instances, a bright red colour; and this was especially the case when the person had remained long in the condensed atmosphere. The movements of the limbs appeared to be more easy than in the normal air.—*Brit. and For. Med.-Chir. Rev.*, July, 1863.

7. *On the Filtration of Air, in reference to Putrefaction, Fermentation, and Crystallization.*—The following are the final conclusions of SCHRÖDER on this subject:—

1. All vegetable or animal forms derive their origin from other living vegetable or animal beings. *Omne vivum ex vivo.*

2. When a series of specific products of fermentation and putrefaction is developed at a certain spot, germs which originate the process have been conveyed to that spot through the medium of the air. Such is certainly always the case with regard to germs of mould, and to the ferments of wine, milk, and urine.

3. Vegetable and animal matter, in which all germs have been destroyed by boiling, and which, while still in a hot state, has been shut off from the direct influence of the external air by means of cotton-wool, remains perfectly free from mould, fermentation, or putrefaction. The germs, which otherwise would be supplied by the air, are arrested in the passage of the latter through the cotton-wool.

4. The germs of most vegetable and animal substances are destroyed by exposure for a short time to a temperature of 100° C.

5. But milk, yelk, and meat contain germs which are not thus killed. Boiling at a higher temperature under higher pressure, or long-continued boiling at 100° C., will, however, always suffice to destroy these germs also.

6. The germs in milk, yelk of egg, and meat, after having been boiled a short time, are still capable of being developed into the specific ferment of putrefaction, and sometimes also—those of yelk, at least—into long and indolent vibriones.

7. The specific ferment of putrefaction is of an animal nature. It develops itself and multiplies at the expense of albuminous compounds, but does not multiply under those conditions alone which supply all the requisites for vegetable growth.—*Sydenham Society's Year Book* for 1862, from *Annal. der Chem. u. Pharm.*, vol. 117.

8. *Error of supposing the Flexor Longus Pollicis Pedis Muscle of Man as, normally, a Flexor of the Great Toe only.*—Dr. JOHN STRUTHERS exhibited to the Medico-Chirurgical Society of Edinburgh a dissection showing the tendon from the flexor longus pollicis to the second toe to be larger than usual. Dr. S. remarked that this variety was one of degree only. The tendinous slip commonly described as connecting the tendon to that of the flexor longus digitorum was nothing less than a tendon from the so-called flexor longus pollicis to at least the second toe as well, constituting the latter, so far, a second flexor communis

Normally, the tendon to the second toe was from one-fourth to one-third of the size—sometimes more, sometimes less—of the tendon to the great toe, and therefore of nearly full proportionate size, when the relative magnitude and strength of the two toes were considered. It was larger than, and might be twice as large as, the tendon which the second toe received from the flexor longus digitorum, underneath which (as the sole lay in dissection) it passed before the two united, and the first lumbricalis muscle arose from it more than from the tendon of the flexor longus digitorum. By its connection with the expansion formed by the flexor longus digitorum, or rather with that of the flexor accessorius, it was enabled to act, though less directly, on the other toes, at least on the third. The flexor longus digitorum sometimes also gave, in exchange, a slip to the flexor pollicis, but this is a variety.

The occurrence of a tendon from the flexor longus pollicis to the second toe had been looked on by some as a variety, and as then establishing a significant correspondence to the condition in some of the quadrumana. The true zoological affinity was, however, best indicated by considering that, in ordinary five-toed quadrupeds, the five toes were supplied by a common muscle, that in the quadrumana there was either the same, or two common flexors variously disposed, or a connection between the two muscles, while, in man, the corresponding condition remained in the foot, but disappeared in the hand by the complete differentiation of the flexor longus pollicis from the flexor profundus digitorum. The enormous development of the hallux, required for the erect posture, with the corresponding development of its long tendon, threw the other tendon relatively into the shade; but the connection was not severed, as the hallux was not used as an independent digit, as the pollex of the hand was. What was remarkable in man, therefore, was not the presence of an association between the tendon of the pollex of the foot with the tendons of the other digits, but the absence of it in the hand.—*Edinburgh Medical Journal*, July, 1863.

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## MATERIA MEDICA AND PHARMACY.

9. *Gluten in Crust of Bread.*—M. Barral has presented to the Academy of Sciences some remarks of much interest concerning the crust of bread and the gluten contained in it. He had recently shown that, when equally dried, the crust of bread is more highly azotized than the crumb; and he also showed that the crust was more soluble than the crumb in water. M. Payen had, it is true previously pointed out this greater solubility of the crust, and had ascribed it to the conversion of the starch into dextrine during the baking. But M. Barral's experiments show another important fact. "If," he says, "we exhaust with water an equal quanity of dry crust and dry crumb of bread, we find that the soluble portion of the crust consists of from seven to eight per cent. of nitrogen, whilst the soluble portion of the crumb contains only from two to three per cent. The greater solubility of the crust consequently, depends upon the transformation which its gluten has undergone under the direct action of the 200° to 220° heat of the oven. The soluble portion of the crust is more highly azotized than the juice of meat." M. Barral added, that he was still engaged with his experiments, which would throw some new light on panification.

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10. *Combination of Protiodide of Iron and Manna.*—The protiodide of iron, in the form of pills, is very commonly employed in France, and the preparation generally contains the protiodide with a certain proportion of honey powdered liquorice, and powdered mallow. M. Foucher recommends a kind of sugar-plum (*dragée*), composed of protiodide of iron, purified manna in tears, and powdered liquorice and mallow. By the union of these substances, M. Foucher obtains a mass in which the combination of manna with the protiodide preserves the latter from any alteration, and it forms a true paste which, when divided into pills or *dragées*, softens by the heat of the hand. Each *dragée* broken

into pieces presents internally the greenish colour characteristic of the well-prepared and well-preserved protosalt of iron. In this preparation, therefore, there are two essential conditions observed—namely, the preservation of the salt without chemical alteration, and its easy solubility in the digestive passages. But M. Foucher also believes that the manna, by its laxative operation and its stimulating the secretions of the digestive canal, would also act both in facilitating the absorption of the drug and preventing the tendency to constipation which is one of the most troublesome effects of the ferruginous preparations.—*Brit. and For. Med.-Chir. Rev.*, July, 1863, from *L'Union Médicale*, April 7, 1863.

11. *Liquid Permanganate of Potash.*—M. LECONTE prepares this solution in the following manner: Caustic potash, six drachms; chlorate of potash, five drachms; binoxide of manganese, five drachms. Dissolve the caustic potash and the chlorate in a small quantity of water, and add the manganese; get rid of the water by evaporation, stirring constantly, and calcine the dry mass to a dark red for an hour in an untinned iron cup; allow to cool, and add a quart of plain water. Then boil for five minutes in a china capsule, and you will obtain a fluid of a slightly purplish tint; decant the solution, and wash the residue with such a quantity of water as to make altogether two quarts. When filtering is thought necessary, the liquid should be passed, not through paper, but through very fine sand. For dressing foul wounds, or for injecting, use one drachm of this solution to from three drachms to five of spring water.—*Lancet*, Aug. 22, 1863.

## MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

12. *Epidemic Angina Pectoris.* By M. GÉLINEAU.—This epidemic, which seems to be not unlike one which was described by Dr. Von Kleefeld as occurring at Dantzig in 1824, prevailed on board the *Embuscade*, a corvette in the French Imperial navy, in 1858. The crew of this vessel numbered 250 men and boys. For some months this crew had been exposed to considerable alternations of climate, in consequence of the corvette being constantly on the move between stations on the Mexican, the Chilian, and the California coast; and besides this, there was reason to believe that not a few of the number were abandoned to various most demoralizing practices. The epidemic angina pectoris, which broke out in the neighborhood of St. Helena, after some days of very stormy weather, was preceded by a few isolated cases of the same disorder, and of colic, neuralgia, and scurvy. On the 13th of March, an old sailor, who was both scorbutic and anæmic, was attacked while climbing the mast; five days later three others were attacked in the same manner; and between the 18th and the 23d two others. The corvette remained at St. Helena ten days, and during this time the health of the men improved and there were no fresh cases of angina pectoris; but as soon as the vessel got out to sea again—as soon, almost, as the voyage was resumed—six new cases broke out, in persons all of whom were very decidedly scorbutic. M. Gélineau, after detailing the individual cases, gives the following general description of the disorder. The pain begins invariably at the sternum, and is acute in proportion to its vicinity to the heart. It is behind and to the left of the sternum, generally. In one instance it began at the basis of the thorax, in another over the musculus rectus, in a third in the right hypogastrium; in all cases it shot in unbearable pangs towards the heart, and usually these pangs were accompanied by a distinct dread of death. In the majority there was, in addition, a pain in the left shoulder. The patients sought relief by drawing deep breaths, and by bending towards the left side. The pulse generally was retarded and small, and not unfrequently this condition of the pulse was accompanied by palpitation and violent action of the heart, as judged by the strong impulse of the apex of

the organ against the side. During the attack the patient dared not venture to speak, and for some time afterwards his words were scarcely audible and the fewest possible. Eructation, with a feeling of relief, followed the attack in eight cases; vomiting, without much relief, in three or four instances. Once the attack was followed by retention of urine. No attack happened during the night, and the most common time during the day was during the afternoon *siesta*. After awhile any effort, or the act of eating, was a sufficient exciting cause. The treatment consisted in the application of dry cupping glasses with various anæsthetic applications externally, and with narcotics internally.—*Ranking's Abstract*, vol. xxxvii., from *Gazette des Hôpitaux*, Nos. 114, 117, 120. 1862.

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13. *Pseudo-gangrenous Bronchitis.*—A man, aged 40, a paper-maker, of good constitution and habitually enjoying excellent health, was seized early in April with cough and abundant expectoration of matter having a fetid odour. These symptoms appeared when he was apparently in the best health, and were unattended by any constitutional disturbance. The patient ate and worked as usual; he was troubled only by the frequency of the cough, by the abundance of the expectoration, and by the daily increasing fetidity of his breath. His fellow-workmen complained of the odour, and this symptom became so unbearable that he was obliged to enter the Hospital de la Pitié, under the care of M. Empis.

On admission, his breath, especially when he coughed, was extremely offensive. His sputa consisted of glairy transparent colourless matter, very frothy on the surface, holding in suspension a number of small unequal masses of opaque mucus, which floated free in the colourless portion of the sputa: the whole sputa had a peculiar very disagreeable odour, resembling that of gangrene of the lung. On pouring the sputa into a basin of clear water and stirring the mixture, the opaque masses did not communicate to the water the least muddy tint, as purulent sputa do.

The conformation of the patient's chest presented nothing remarkable; percussion elicited a normal clear sound in all points of the lung; on auscultation, there were heard behind, over a space 6 or 7 *centimètres* in diameter below the angle of the right scapula, some moist mucous *râles*, with unequal bubbles, which were partly displaced by coughing. There did not appear to be any pathological modification of the voice.

The patient felt no oppression, and could make large and deep inspirations without the least pain. His sleep was often interrupted by the cough and by desire to expectorate. He was not able to lie on the left side, from a feeling of suffocation when he did so. He had a good appetite; ate and digested well; and had never had fever.

In a clinical lecture on the case, M. Empis remarked that the fetidity of the breath and sputa gave at first the idea of pulmonary gangrene. But the sudden manner in which the expectoration was produced, without having been preceded by any symptoms of disease, and the general state of the patient, so little in harmony with the severity of the general symptoms ordinarily met with in patients affected with gangrene of the lung, forbade the idea of this condition to be entertained. Gangrenous fetidity of the breath and expectoration does not belong exclusively to pulmonary gangrene, and may be met with in certain diseases of the bronchi independent of true gangrene. Laennec more than suspected this, when, failing to find the pathological characters of pulmonary gangrene in patients who had had fetid bronchorrhœa, he suggested that the fetidity of the expectoration depended on a general disposition to gangrene, which excited the mucous secretion of the bronchi. Since that time, M. Briquet has pointed out that, in addition to pulmonary gangrene properly so called, there is an affection of the bronchi which resembles true pulmonary gangrene in the special fetidity of the breath and sputa, but which differs from it in its symptoms, in its pathological anatomy, progress, and frequently favourable termination. M. Lasègue has called this condition *curable* gangrene.

The quantity of the expectorated matter varies much. In the present case,

it was about a quart daily: but frequently it amounts to several quarts in twenty-four hours. In cases of long standing it contains, in addition to the elements already described, a grayish finely granular matter, not at all viscous, which is deposited at the bottom of the vessel. It is partially miscible with water, to which, when beaten up in it, it communicates a more or less muddy tint. The fetidity of the breath varies in degree; on some days it is slight, while on others it is very intense; it may disappear in favourable cases, with the catarrhal secretion with which it is connected. The expectoration is not unfrequently preceded by the formation of vomicæ, which burst in coughing, and discharge their contents.

In most cases, there are no remarkable physical signs; there may be no general symptoms, or there may be slight febrile reaction; but in no case is the disease attended with the severe symptoms which ordinarily accompany gangrene. When death occurs, it takes place as the result of exhaustion produced by the excessive secretion, unless the patient be carried off rapidly by some acute complication, such as pneumonia or erysipelas.

The pathology of the diseases does not appear to be positively determined. M. Briquet believed that the extremities of the bronchial tubes become dilated, and affected with gangrene independently of the other parts of the lung. M. Empis criticizes the latter notion at some length, and says that it seems to him more rational to admit that the disease consists in a special pathological alteration of the mucous membrane of the bronchi, in virtue of which they become dilated, while at the same time their internal surface secretes a prodigious quantity of fetid matter. The disease then may be theoretically resolved into dilatation of the bronchi; bronchorrhœa; and gangrenous fetor. But these are neither successive nor subordinate one to another; they advance equally, and it is their union and indivisibility which constitute the special character of the disease.—*British Med. Jl.*, Aug. 1, 1863, from *Gaz. des Hôp.*, June 2, 1863.

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14. *Infantile Paralysis.*—Mr. HOLMES COOTE has published (*Lancet*, July 11, 1863) some very interesting remarks on this affection. He limits the term "infantile paralysis" to one of the effects produced by the functional disturbance of the nervous centres. The absence of any recognized morbid change of structure in those cases, where post-mertem examination has been made, is rather owing to over defective means of observation than from no such morbid change existing.

The most common exciting cause of this affection, Mr. C. thinks, "is the irritation of first dentition; but I have known the same effect to be produced by the second dentition, and have witnessed symptoms of analogous character, though not so strongly marked, in the adult. A young lady, twenty-two years of age, whose teeth were crowded together and partly decayed, experienced occasional attacks of numbness and loss of power in one upper extremity, recurring at intervals, until she had been relieved by an experienced dentist of the stumps of a number of decayed teeth, which had been the source of pain. But the attack may be quite sudden, without any recognized premonitory symptom. Thus an infant at the breast will appear to have momentary faintness, or may be taken up by the nurse as usual after an apparently uninterrupted night's rest, and in both instances the limbs may be found paralyzed.

"On May 7th, 1863, I saw a boy, aged eight, at the Orthopædic Hospital, in whom the left lower extremity was smaller in circumference, shorter, and colder than the opposite, the foot being in the position known as equino-varus. His mother gave the following history: At two years of age, when to all appearance well, he suddenly fell down stairs from a landing whereon he was playing. When taken up, it was found that the limb had lost all power, and he has never walked since.

"On the same day I saw another boy, Henry M——, aged four, suffering from talipes equino-valgus of the left limb. The mother said that the child began to walk when about twelve months old. He was then, to use her own words, 'taken off his feet' by vomiting and purging. For two years he was quite unable to walk. He was galvanized at another hospital, but without avail.

After a time he became stronger in the back, and could sit up; finally he recovered the use of all the limbs, except the left lower extremity, which has continued weak, cold, and deformed. The limb is smaller than the opposite in circumference by a quarter of an inch, and shorter by half an inch.

"The same effects have been referred to the influence of eruptive disorders on the frame. On May 18th, 1863, I saw a boy, named Richard G——, aged six, suffering from talipes equinus. The mother said that six weeks after having had the measles he went to bed as usual. The next morning she found the right leg completely paralyzed. After a time some power returned in the muscles of the calf, and the heel was drawn upwards. The limb was smaller in circumference, but not materially shorter.

"I do not believe that 'talipes equinus' is ever congenital as a deformity. Now, there are two classes of cases, which, though allied as indicating disturbance of the nervous centres, and in both instances followed by contractions of the limbs, are yet separated by important points of difference. In the first, the limbs are spasmodically contracted, the thighs and legs bent, the heel raised, and the movements are irregular, but there is neither atrophy of the limb nor diminution of temperature. In the second, the heel may be raised or the foot otherwise turned; but the limb is shorter, smaller, colder, and wasted. In the first, the muscular degeneration and conversion into fat is a slow process, extending over many years. In the second it is rapid, the growth and development of the limb being arrested from every moment of the stroke. I believe the first to be an instance of disturbance of the control of the will over muscular power from *cerebral* irritation, such as would be excited by the deposit of tuberculous matter in the membranes about the cerebellum; the second to be an instance of lesion of the *spinal cord*. And although no very clear line of demarcation can in all cases be drawn between the two, yet we find that in the first class of cases the patients are often morbidly excitable, irritable, and prone to laugh or cry; while in the second class, after the first symptoms have subsided, the functions of the brain do not seem to be affected.

"I fancy that in these cases of cerebral disturbance there is often a congenital defect, the development of the brain and the manifestation of the intellect being imperfect. I am now attending the daughter of a lady, whose case illustrates this point. The child is about ten years of age, and she was put under my care in consequence of her ungainly walk, the knees being slightly bent, and the feet having an inclination inwards. I found that the muscles of the calf were so much contracted that the foot was held at right angles to the leg, and the heels came with difficulty to the ground. The control of the will over the muscles generally was imperfect. The child could learn a short lesson, but was not studious; was subject to violent fits of temper, and never had shown affection for any about her. The general aspect was such as warranted a prediction that these peculiarities might become stronger with age.

"The ultimate effects of infantile paralysis, dependent on lesion of the spinal cord, as it affects the limbs, are as follows:—

"In by far the greater number of cases the loss of power is in the lower limbs. At the commencement the paralysis may be general and complete, but usually all the limbs save one recover as mysteriously as they were attacked. Neither sex nor side of the body seems to exercise any influence. Boys and girls, right and left side of the body, suffer equally. But the paralysis is rarely complete: the foot rarely hangs powerless; usually the muscles of the calf retain some power, and pull up the heel (talipes equinus paralyticus); or the foot may incline inwards (talipes equino-varus); or the muscles of the calf and the peronei may pull it outwards (talipes equino-valgus); or, finally the anterior tibial muscles may overcome the paralyzed muscles of the calf, producing talipes calcaneus.

"As patients grow up, the great annoyance which they experience is the liability to sprains. All the ligaments are weak and elongated; and if a person so afflicted tread on a stone or any rough body, he gives the limb a twist which lays him up for days.

"The affection may be limited to an upper extremity, in which case, usually, the deltoid muscle becomes paralyzed, and the humerus drops from the socket;

or, in rarer instances, the muscles of the upper arm become wasted, the forearm being well formed as usual.

"There are cases in which the affection comes on slowly and progressively; others in which first one limb and then another is attacked, but these are comparatively rare. I saw a boy, aged sixteen months, in whom the right heel had been drawn up when the child was five months old. That attack passed away; at the present time (May 18th, 1863) the left heel is contracted.

"In all these cases, the treatment consists in an attempt to remove the source of irritation, whether it be seated in the brain or spinal cord, or whether there be any amount of reflex irritation. As a general rule tonics are not indicated; but purgatives and small doses of tartar emetic often relieve symptoms. The temperature of the limb must in all cases be carefully maintained; and when, finally, the contraction has become permanent, the proper tendons should be divided, and elongated by subcutaneous tenotomy and extension, the foot being held in proper position by the aid of irons. The details of the treatment would lead me into particulars which are already well known to the profession, and which require modification according to the nature of the case."

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15. *Cirrhosis of the Liver in a Child five years old.*—Dr. DAVID MURRAY, Resident Surgeon Royal Maternity Hospital, Edinburgh, reports (*Lancet*, Aug. 22) the following case of this: M. C., aged five years, came under Dr. M.'s care about three weeks before her death, complaining of severe pains in the abdomen, with bearing down, and passage of blood. On investigating her history, it was found that up to three years of age she had always been a very healthy child, when at this time she began to experience transitory pains in the abdomen, more especially in the hepatic region. At times these were so severe that the child could not tolerate them, and, though naturally patient, she screamed in agony. Soon afterwards she began to be affected with a sensation of bearing down, which caused her to go to stool very frequently. Her constitution began to give way, and from being strong and healthy she became pale and anæmic. The mother stated that she applied to several medical men, without, however, deriving any good. At this time no suspicion was entertained regarding the nature of the case. She continued in this chronic condition of ill-health, having the bearing-down sensation and pain generally diffused over the abdomen, when the mother's attention was attracted by the child's passing blood at stool. She was then placed under Dr. Murray's care. On examination, the abdomen was found to be very much distended, but no fluctuation could be detected. The liver was hard and nodulated to the touch, and when pressed upon the child cried out; the feeling was exactly similar to that presented by a cirrhosed liver. To relieve the pain, warm fomentations were applied over the abdomen, and a few doses of Dover's powder given, which had the desired effect. About a fortnight after she was first seen the patient was attacked with severe hæmatemesis, when she vomited several pints of dark venous-looking clotted blood. A few doses of gallic acid, with cold cloths, and rest in the recumbent posture, were ordered, which for the time had the effect of stopping the hemorrhage; but a few hours afterwards a second attack supervened, which resulted in the death of the child.

As a wish was expressed to have a post-mortem examination, the mother willingly complied with it. On making an incision through the abdominal parietes, the first object which presented itself was the liver, which was covered with nodules varying in size from a hazel-nut to a hen's egg. The parenchyma presented everywhere a granular character, and of a dense, firm, leathery consistence. The granulations varied in size from a pin's head to a linseed, and were separated by corresponding areolar tissue. The intestines were universally covered with ecchymosed spots, and from the rectum upwards were filled with masses and clots of dark venous-looking blood. The stomach also was packed full of clots. The whole surface of the mucous membrane, from the stomach downwards, was carefully washed and examined, but no lesion of any kind could be detected; thus proving that the blood was entirely passive in its origin, arising from the obstruction to the passage of the blood through the

portal vein. The spleen was greatly enlarged and much congested. No examination was made of the head.

Here was a case of distinct cirrhosis of the liver in a child only five years of age, which was not congenital, for she enjoyed good health till she was three years old, nor could any particular cause be assigned for it. The child herself had a peculiar repugnance to alcoholic stimulants of every kind. With regard to the parents themselves, they certainly were very intemperate in their habits. The records of children's complaints do not present a similar case in so young an individual.

16. *Vaccination of Young Children.*—The following report by Dr. David Murray, on the results of vaccinations at the Maternity Hospital, was read before the Obstetrical Society of Edinburgh: "I have myself vaccinated altogether about twenty-five cases, a few of them being done by others, at my request, out of doors. The following exhibits the respective ages of the patients: Five at 1 day old; six at 2 days; three at 3 days; four at 5 days; four at 6 days; three at 7 days. In every case the vaccination was perfectly successful, and seemed to take very readily—the amount of lymph in some instances being almost imperceptibly small. The vaccine vesicles went through their course successfully in the usual time, and were very complete and well formed. No injurious effects were observable; the children took the breast, and appeared as if nothing unusual had been done to them. No child of even three months could have been less disturbed.

"If dangerous results had been likely to have followed the performance of the operation, I believe that it would have been so in the present instances, as it is well known that many of the children born in the Maternity Hospital are very unfavourably situated, having by no means good constitutions transmitted to them. Though, therefore, the number is comparatively small from which to form an extensive induction, yet I consider that the present results sufficiently entitle us to draw the following conclusions:—

"1. That no danger attends vaccination at even the earliest period of existence, and that, therefore, it may be done with perfect impunity.

"2. That the vaccine lymph seems to affect children as readily, if not more so, at that early period than at a more advanced age.

"3. That most of the dangers or bad effects which are said to have followed the employment of early vaccination cannot fairly be attributed to any constitutional disturbance occasioned by the operation, but must have arisen altogether independent of it."

The following report by Dr. Ritchie was also read: "1. Mrs. F.'s boy, 12 hours after birth—successful. 2. Mrs. C.'s boy, 10 hours after birth—successful. 3. Mrs. M.'s boy, 62 hours after birth—successful. 4. Mrs. B.'s boy, 5 hours after birth—successful. 5. Mrs. B.'s child, 5 days after birth—successful. 6. Mrs. M'K.'s child, 4 days after birth—successful. 7. Mrs. M'L.'s boy, 3 days after birth—unsuccessful."—*Edinburgh Medical Journal*, July, 1863.

17. *Treatment of Malarious Fever by the Subcutaneous Injection of Quinia.*—Mr. W. J. Moore, of the Bombay Medical Service, extols (*Lancet*, August 1, 1863) this mode of treating malarious fever. He states that he has administered quinia by subcutaneous injection "in upwards of thirty cases of intermittent fever, and in several cases of remittent, and with almost invariable success, the former class seldom requiring a second application, the latter generally subsiding after the fifth or sixth injection. Since the period I commenced to use quinia in this manner I have been surprised and pleased to find in one of the medical periodicals that the same plan has been pursued by Dr. Chasseaud, of Smyrna, who reports 150 cures, and especially recommends the system in fever complicated with gastric symptoms, when the exhibition of quinia by the mouth is often 'inefficient, difficult, and hazardous.'

"I use the strongest solution of quinia which can be prepared—viz., thirty grains of quinia, eight or ten drops of dilute sulphuric acid, and half an ounce of water. Of this I inject from half a drachm to a drachm, the former quantity containing some four grains of the active agent. With the exception of a little sulphate

of soda if the bowels are confined, I use no other remedies whatever in uncomplicated cases of any type of malarious fever. When the spleen is enlarged, or if a leucocythemic condition is present, I prescribe, as an additional curative agent, one or other of the preparations of iron—very frequently the citrate of iron and quinia.

I generally inject beneath the skin over the outer belly of the triceps extensor muscle, and sometimes over the deltoid. I have, however, used the syringe with equal effect on the thigh and calf, and in cases of enlarged spleen have thought the action of the remedy increased by injecting over that organ. I use a small glass syringe with the screw action, and furnished with a sharp silver point some half an inch in length. The latter is introduced beneath the integument half an inch or less, and the pain is not greater than the prick of a pin. Indeed patients have frequently declared they would rather submit to this process than taste the bitter of quinia. I have never seen the slightest inflammation or irritation follow the operation except in two instances. In one of these this result was due to the instruments employed—namely, a small trocar and common glass syringe; in the other, to quinia in *suspension* being used instead of in *solution*. Indeed, I have reason to think that quinia in suspension is very irritating to the tissues, and this is what physiology would lead us to expect, as it is certain that when a fluid material is introduced into the areolar structure, it will be absorbed more directly than any solid mass could be. Therefore, to avoid irritation of the parts, and, also, to prevent "choking" of the syringe (and which instrument was procured from England), I insist upon a perfectly clear solution of the alkaloid.

The best time to inject is shortly before the expected cold fit, but it may be done during the first stage with the effect of lessening and sometimes stopping the whole paroxysm. Latterly, when a patient presents at the morning visit, who expects an accession during the day, I have injected at the time, and nearly invariably the fever has stopped.

In cases of remittent I have endeavoured to inject during the remission, but do not wait for this period. In severe cases the injection should be repeated at intervals of six or eight hours.

I believe four or five grains of quinia injected beneath the integument are equal in their effects to five or six times that amount taken into the stomach: also, that the effects are more certain than when taken in the ordinary method; and, also, that relapsing attacks are less common than when the remedy is administered by the mouth.

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18. *Treatment of Suspended Animation.*—The number of the *British and Foreign Medico-Chirurgical Review*, for April last, contains an account by Dr. B. W. RICHARDSON of his interesting researches on this subject. The following are the conclusions to which they lead:—

1. They indicate that artificial respiration can prove of avail only while the heart is transmitting a pulmonic wave of blood, and that in the absence of this wave, artificial respiration is injurious; injurious to the lungs and fatal to the blood.

2. They indicate that if a current of blood can be made to traverse the arterial channels, the muscles of respiration, previously at rest, will resume their action; and that respiration will follow, as at birth.

3. They point out that the effect of gentle external warmth is to induce an arterial tide; and that in every inquiry in respect to re-animation, the most careful attention must be directed to the further elucidation of this one subject.

4. They point out that galvanism is a dangerous remedy in all cases; that its effects cannot be measured, and that while it may set up a temporary excitation, it wears out excitability.

But, more than all, they indicate that between the time of so-called death and the period of the coagulation of the blood, re-animation is a possible fact; that the same rule, being applied to the body at large, as is often applied to the finger or other part of the body removed by accident—namely, the re-establishment through it of a blood-current—the body would re-live as a whole as it does

in part; in a word, they show that the old principle, however it may at present fall short of demonstration, is true: "that which is of the local is of the general."

[In connection with this, we would refer to some researches by the same investigator, which we gave in the number of this Journal for June, 1862, p. 232.]

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19. *Dietetic Treatment of Albuminuria.*—The researches of M. Hamon, contained in a note on albuminogenesis communicated to the Académie de Médecine on the 29th April, 1862, appear to throw considerable light upon the question whether any kinds of aliment increase or diminish albuminuria. He found, for instance, that soft-boiled eggs were very easy of digestion, and exercised a very slight albuminogenic influence, and it has therefore been suggested that in albuminuria an albuminous diet might be ordered, composed principally of soft-boiled eggs and albuminous water. Vegetable diet has also been sometimes employed in albuminous anasarca, sometimes with partial, sometimes with perfect success. But all kinds of diet that have been adopted in albuminuria are inferior to that of milk, as recommended by M. Guignier. The latter physician adopts the treatment of albuminuria devised by M. Serres, and which is founded on the combination of three plans—namely, the diminution of drink, the milk regimen, and the use of raw onions. The plan consists in choosing the milk with great care as to its freshness and quality, in substituting one milk for another when the first disagrees with the patient, allowing the patients to determine the quantity they drink, uniting lime or magnesia with the milk when it causes acidity, and abandoning the treatment at the end of twenty days, if it has not produced a decided good effect. M. Guignier believes that the diuretic property of the raw onion has a beneficial effect upon the disease, and that these vegetables ought to form part of the milk regimen. The editor of the *Bulletin Général de Thérapeutique* thinks that albuminuria may be cured by dietetic means, if they are adopted early, when the effusions are recent, and before the albuminuria has lasted long enough to have produced in the renal tissues the organic changes which place the case beyond the hope of cure.—*Brit. and For. Med.-Chir. Rev.*, July, 1863, from *Bull. Gén. de Thérap.*, March 15, 1863.

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20. *Use of Perchloride of Iron in Diphtheria.*—It is now generally admitted, that the pseudo-membranous formations of the throat or larynx ought to be treated with tonics instead of antiphlogistics. M. Courty is persuaded that these diseases are of an adynamic nature, and he disapproves of any measure which would have the effect of weakening the organism, admitting only such remedial means as are of an opposite nature, such as a substantial and restorative diet, and among medicines, cinchona, and especially iron, which without being a specific, he regards as assisting essentially in the cure. He considers the solution of the perchloride of iron to be the best of the ferruginous preparations, but he thinks that there are some others which may be preferred in certain cases, as, for instance, the iodide of iron in scrofulous children. M. Courty employs the perchloride in two forms: 1. Internally, in the dose of twenty-five to thirty drops in a glass of water in twenty-four hours, given in teaspoonfuls, and each dose followed by a mouthful of milk to remove the styptic after-taste. He continues the medicines, even after the cure, for a sufficiently long time to restore the strength and to shorten the convalescence. 2. He employs it locally, if not to the exclusion of every other topical application, still with a marked preference, and the reason of the preference is, that the solution has at once a caustic, hæmostatic, and tonic action, by virtue of which it very favourably modifies the surface after the removal of the false membrane, and spares the neighbouring parts, which are not denuded of epithelium; and besides, if it is impossible to remove the diphtheritic patch, the perchloride of iron possesses the valuable property of acting upon it and penetrating it, of infiltrating itself under its edges, and thus going on to reach and modify the subjacent tissue.—*Brit. and For. Med.-Chir. Rev.*, July, 1863, from *Researches on Croup and Diphtheria.* Montpellier, 1862.

21. *Sarracenia Purpurea in Smallpox.*—Mr. J. F. MARSON, Surgeon to the Smallpox Hospital, London, in a communication to the *Lancet* (July 4, 1863), states that he has used the sarracenia in smallpox, and has not observed from it any effect whatever. "It did not save life; it did not modify in the least the eruption of smallpox; it did not influence any of the secretions; it did not increase the secretion of urine; in only one instance did it seem to act on the bowels, and this seeming effect might easily have been from other causes."

Notes of fifteen cases treated by the sarracenia were given, all of which terminated fatally.

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## SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

22. *Curability of Abscess in the Brain.*—In a recent communication to the Academy of Sciences, in Paris, M. FLOURENS relates some extraordinary facts concerning the brain, resulting in part from his own experiments. He quotes several instances, recorded in history, of cures effected, in cases in which the brain received serious injuries; among them that of a young officer in the time of Fronde, whom Cardinal Mazarin had always refused to promote on the plea "that he had no brains." In one of the engagements of those stirring times, this young man received an enormous wound on his head. The surgeon in whose hands he was, astonished at the quantity of brain which issued from the wound, preserved it in spirits, and subsequently, after this patient had recovered, showed it to him. "Oh!" exclaimed the latter, "pray send that to the cardinal, to prove that I have more brains than he is aware of." Another case mentioned was that of a young man of sixteen, who had been struck by a stone on the left parietal bone. As the bone did not present any appearance of fracture, the treatment employed by the surgeon, Lapeyronie, was of the simplest kind. But on the 25th day, the patient's right eye began to grow weak, and three days later its power of vision had ceased, the patient himself being in a state of absolute prostration. Lapeyronie made several incisions on the skull, which he trepanned three times; the dura mater was relieved of a few splinters which pressed upon it, after which he opened it, and a quantity of purulent matter issued forth. Immediately the prostration ceased, and the patient recovered his eyesight and the complete use of his other senses. At the end of two months he recovered his health entirely, although he had lost a considerable quantity of brain. M. Flourens then recalls to mind several experiments of his own on animals, which he deprived in some cases of one lobe, and in another of both lobes of the brain, the animal living upwards of a year after the operation; but having lost all its senses, and being reduced to the state of a mere automaton. In another instance the whole cerebellum was extracted; the animal lived for more than a year after the loss, but never recovered the regularity of its movements, being reduced to a permanent state of apparent drunkenness. M. Flourens next proceeds to describe certain new experiments, in which he introduced leaden bullets into the brain of rabbits and dogs. The bullets were placed on different points of the upper region of the encephalon, on the lobes, and the cerebellum. The bullets, left to the action of their own weight, penetrated by degrees into the substance of the brain, and ultimately stopped at the basis of the cranium. The passage thus opened through the substance soon closed and healed; and if the bullet was not too large, none of the regular functions of the animal were disturbed, and no inconvenience whatever was produced.—*Ranking's Abstract*, vol. xxxvii., from *Gazette Hebdomadaire*, Nov. 28, 1862.

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23. *Treatment of Damaged Brain from Mechanical Injury.*—Mr. PAGET, Surgeon to St. Bartholomew's Hospital, in a clinical lecture on a case of fracture of base of the skull, makes the following excellent remarks on the treatment of damaged brain:—

What is the treatment of fracture of the base of the skull? As regards the

fracture, all we can do is to leave it alone. Occasionally, recovery will take place. As regards the damaged brain, do nothing but shut out all possible sources of mischief. For instance, keep away all possible causes of excitement. Just as we would keep a hurt joint quiet, so we ought to keep a hurt brain quiet. When the patient even looks or thinks, or is roused up, it is like moving the injured brain. In private practice it is difficult to keep the patient quiet, but in hospitals this can be more easily managed. The friends of such patients almost insist on something being done. This question of treatment may be illustrated by the way in which we treat an injury elsewhere, as, for instance, a bruised muscle. There is nothing to do but to keep it at rest. Would it occur to any one to bleed here? And yet it occurs to men of sense to bleed because a man has hurt his brain. What good would it do in injury to a muscle to give mercury? And yet it seems not unusual to give mercury in injuries to the head. Of course there are cases in which there are distinct indications for this kind of treatment. Its adoption as a matter of routine in injuries to the head was to be deprecated. If (Mr. Paget said) the surgeon is not prepared to give mercury in bruised muscle, he has no ground whatever for giving it in injury to the brain. If, however (he continued), his patient had had symptoms of inflammation, he would proceed to treat it, but as yet he had had no symptoms of the kind. Delirium, convulsion, or other symptoms of cerebral disturbance, are not sufficient alone to establish the diagnosis of inflammation of the brain. The signs to be relied on are those that would indicate inflammation elsewhere—the pulse full and rapid, breathing rapid, skin hot, and the organs of sense acute, and the pupils acting more rapidly. If these symptoms are not present, we ought not to bleed or give mercury, on account of delirium or convulsions, or other symptoms of cerebral disturbance.

What we ought to do is, as before mentioned, to keep away from the patient all possible sources of excitement. We ought also most carefully to attend to the bowels and to the digestive organs. We should keep in mind that the patient can digest little, and, therefore, give but little, and that generally fluid. If the general health should flag, then we should give wine. * * *

In reference to treatment of inflammation following injuries, Mr. Paget said, that if the symptoms set in soon after—*e. g.*, within the first two or three days of an injury, or of an operation—we might bleed or depress the patient, or at least refrain from stimulating him. But, when the symptoms set in later—*e. g.*, as in this case, on the eleventh day—then clearly the inflammation was an asthenic one. It was analogous to erysipelas setting in some days after an operation. If, after an amputation, we find tenderness and swelling of the stump within two days, we may treat it with depressing means, apply leeches, or cold lotions, or, perhaps, rather, merely keep the patient quiet, and refrain from stimulants and full diet. But if on the eleventh day the stump were to inflame, we should treat the patient with good diet and stimulants. Just so in injuries to parts we cannot see. If after ten days signs of inflammation set in we ought to give wine, just as we ought in erysipelas of the scalp setting in at that time. In fact, we ought to be guided by the time when the symptoms set in, as well as by the symptoms themselves. The man's breathing was more frequent, but it was more shallow; his pulse was quicker, but it was more feeble, so that everything indicated stimulants. That the treatment was unsuccessful does not necessarily show that it is wrong. In fractures of the base of the skull, if we save one in twenty, we should do very well indeed.—*Medical Times and Gaz.*, Feb. 21, 1863.

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24. *Management of Patients after Surgical Operations.*—Mr. PAGET, in his anniversary address on this subject before the British Med. Association, remarks that, though the preference of immediate union is generally just, it may become an unwise prejudice. "When that mode of treatment is attempted and fails, it may lead to something more than disappointment—it may be very mischievous, for there is no local source of blood-poisoning more effectual than the retention of blood or pus till they decompose behind the edges of a wound unwisely united. The rule, therefore, for the choice of modes of healing may be always in favour of union by the first intention, when there is a reasonable

probability that it can be, at least, in good part accomplished; but when there is less than a reasonable probability, to make no attempt at it. The local treatment may be summed up in two words—repose and cleanliness. The cleanliness should, however, include more than it commonly does, such as the use of general or large local baths, the value of which, especially after lithotomy and other perineal and pelvic operations, cannot be overstated; and of the frequent change, not only of dressings, if there be any, and of bed-linen, but of beds; and, during convalescence, the change of rooms or of one part of the ward for another. As to general treatment, the best plan is to let the patients be as nearly as possible in the ordinary mode of prudent life, to give no medicine of which the need is not expressly indicated, to observe all rules of personal cleanliness, to provide abundant fresh air, and a sufficient or a liberal mixed diet.

"I believe, then, that in our retrospect of the management of patients after surgical operations, we may congratulate ourselves on the increasing simplicity of our practice, founded on the wider recognition of the sufficiency of the natural processes of recovery. And herein surgery may be said to have been a good contribution of that more accurate study of the natural history of disease which is becoming the most pressing want of our time. What will happen if this or that injury or disease be left to itself, or only so managed as the patient's comfort may suggest? The question has been often asked, but rarely answered; yet it must be answered before we can accurately study the value of any medical or surgical remedy. It is the question in therapeutics that should most occupy our minds; for until we have made our standards of what the progress of disease is if left alone, we cannot judge of our power of controlling or of remedying it."—*British Med. Journ.*, 1862.

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25. *Treatment of Tetanus by Large Doses of Morphia.*—In an extremely severe case of tetanus in a boy of fourteen years of age, twenty days after the cure of a puncture of the sole of the left foot by a thorn, Dr. GRESSY employed the hydrochlorate of morphia in large doses; and although the tetanic convulsions had already seized the diaphragm and the extrinsic muscles of the thorax, he had the satisfaction of saving the patient's life. As soon as the first symptoms of *morphinic* poisoning (sleep and abundant sweating) were manifested—namely, less than twenty-four hours after the commencement of the treatment, the tetanic symptoms made no further progress. The fits came at longer intervals, but at every attack the trismus, opisthotonos, and the abdominal and thoracic stiffness preserved their intensity. The fits soon diminished in length, and lastly the convulsions became less violent. Dr. Gressy was obliged to wait a week before all traces of convulsion had disappeared, and during this time the nervous system of the patient remained permanently *morphinized*. When the sleep was tranquil and continuous, and the sweating profuse, the morphia was discontinued for twelve or twenty-four hours, and then its use was resumed. Miliary eruption and itching exhibited themselves at the same time that the tetanic convulsions began to diminish. Dr. Gressy therefore believes that the want of success which has often been observed in cases of tetanus treated by morphia, is due to the timidity with which the remedy has been employed; and he observes, that the tetanus, when arrived at its highest degree of intensity, began and continued its retrograde course in proportion as the *morphinic* poisoning affected the innervation.—*Brit. and For. Med.-Chir. Rev.*, July, 1863, from *L'Union Médicale*, May 26, 1863.

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26. *Fractures.*—Mr. W. H. B. WINCHESTER makes (*Lancet*, Aug. 22, 1863) some remarks on the principles of treatment of those accidents which are worthy of consideration.

"In the first place," he says, "with regard to Extension. The views entertained respecting it are so erroneous, that until they are entirely abandoned no improvement can take place. Muscular contraction has been, and still is, the real bugbear. To counteract its supposed baneful influence, or in other words, to keep up permanent extension, has been the chief object sought to be attained, and no combination of forces the ingenuity of mechanicians could devise has been considered too powerful to attempt its accomplishment. Look, for instance,

at the powerful screws attached to the extremities of some instruments—at the railway splint of Professor Dummreicher, some time since used in St. Bartholomew's Hospital, by which the lower part of the splint, supporting and holding in its grasp the lower or separated portion of the limb, is so contrived as to run away with it to the utmost limit of muscular elasticity. Such, too, is the effect of the practice of attaching a heavy weight to a cord from the foot, and letting it run over a pulley at the end of the bedstead. A similar result also follows the application of the most commonly used of all splints—viz., Desault's long splint, and of all ordinary forms of apparatus. Extension, therefore, as at present understood and practised by the above means, is a persistently active, and as such an injurious force. It can only be beneficial when temporarily employed to effect replacement. As soon as this is accomplished it ought to be superseded by the passive, enduring, and consequently beneficial force expressed by the term Retention.

"Now this much-dreaded muscular contraction, the involuntary result of fracture, hitherto considered so obstructive, discarded as even worse than useless, and opposed as injurious, is, if rightly understood, a natural power of inestimable value, supplying the exact amount of forcible contact between the broken surfaces necessary to excite healthy reparative action in the most speedy and perfect manner, accurately adjusted to the functional capacity of each individual case. That this view is correct, physiologically, pathologically, and mechanically, will undoubtedly be admitted. At least nine-tenths of the cases of ununited fractures of tardy union and deformity, may be attributed to the misunderstanding, neglect, or overlooking of this obvious pathological effect of muscular contraction.

"Paget, in the last edition of his admirable treatise on Surgical Pathology, when speaking of ununited fractures (p. 193), remarks: 'In other cases the failure seems to occur earlier. No reparative material is formed, and the fragments remain quite disunited. This may be the result of accidental hindrances of the normal reparative process; but it sometimes appears like a simple defect of formative power—a defect which, I believe, cannot be explained, and which seems the more remarkable when we observe the many changes which may at a later time be effected, as if to diminish the evil of want of union.' Is not this its true solution or explanation—viz., that nature, not unequal to the task, has only been deprived by art of the very means which she has specially provided for its accomplishment? How is this provision of nature to be rendered available? By adopting the means I have frequently had occasion to describe—viz., the necessity of aiding and directing nature by suitable, and not retarding or obstructing her by improper, forms of apparatus."

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27. *An Easy Method of Reducing a Dislocated Humerus.*—Dr. Garms describes the following modification of Cooper's procedure. The patient is laid upon the floor, not on his back, but on his belly, some cushions intervening. A towel is attached to the humerus above the elbow, and another, passed round the upper part of the humerus, is given into the hands of the assistant, standing on the side of the dislocated arm. The operator, sitting down on the floor, on the same side, lays hold of the lower towel, and applies the heel of the foot lying nearest the patient to the axilla. He makes extension backwards and downwards, while the assistant draws laterally. The dislocation is thus reduced with surprising facility, the agency of chloroform not being required. The advantage of this modification is that extension backwards may be far more easily executed than when the patient is in the supine position; and this is the direction required in dislocation forwards, which prevails in the great majority of cases. For dislocation backwards, which is very rare, Cooper's procedure is the best.—*Brit. and For. Med.-Chir. Rev.*, July, 1863, from *Archiv. der Heilkunde*, No. 2, 1863.

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28. *Tracheotomy in Children.*—M. Giraldes is of opinion, that the rules laid down for this operation in surgical treatises are not explicit, and that the great variety of instruments which have been proposed tends rather to increase than to remove difficulties, and to confuse the mind of the operator. Ingenious in

their construction, they seem capable of fulfilling every indication, and of enabling hands, however inexperienced, to perform the operation without much difficulty. Most of these inventions testify rather to the ingenuity than to the experience of their constructors. For its rapid execution, tracheotomy requires none of these special instruments—a convex bistoury, slightly pointed, a dilating forceps, and two blunt hooks, constituting all the necessary apparatus. The canula in croup is indispensable. The following rules for the operator may be laid down:—

1. *The Position of the Patient and Assistants.*—This is a very important preliminary, embarrassment and difficulties sometimes resulting from the faulty manner in which the patient has been placed and maintained. The child should be laid on a mattress placed upon a table, having his neck supported by a bolster, and his head thrown forcibly backwards, an assistant kneeling down behind, supporting it firmly in this position by placing his hands over the jaws. Another assistant should fix the shoulders so as to prevent the slightest movement. The patient is thus maintained immovable, and there are none of the oscillations of the trachea which various instruments have been contrived to prevent.

2. *The Operation.*—The operator, standing on the right of the patient, carries his incision, three or four millimetres in length from the cricoid cartilage, rapidly, but without precipitation, as deep as the thyroid gland before it becomes necessary to stop and sponge away the venous blood. The forefinger is then passed into the wound and fixes the trachea, its nail serving as a conductor to the bistoury with which the puncture in the trachea is made. Without removing his nail from the wound in the trachea, the operator slides in the dilating forceps along it, and by a slight pressure secures enough dilatation for the admission of the canula. The child should now be set upright, in order to facilitate the expulsion of false membrane or blood from the air-passages. The end of the canula should be carried directly to the bottom of the wound, in order to prevent its sliding off in front of the trachea. Before securing it, the fact of its entrance into the air-passages must be carefully ascertained. The aperture in the trachea ought not to be of too large an extent, and even if it be made too small it may be easily enlarged by means of a probe-pointed bistoury. During the operation the child should be well covered, and carefully protected from all chills.

3. *Accidents during the Operation.*—The sliding of the canula in front of the trachea has already been adverted to. *Hemorrhage* usually ceases when normal respiration has become established naturally or by artificial means, such as frictions or taps of the thorax, made with the view of regularizing the play of the respiratory muscles. The hemorrhage almost always proceeds from veins, which are sometimes numerous and distended; and when the incision has been carried to a great extent, so as to approach the sternal *fourchette*, there is a great probability that numerous and voluminous venous trunks may have been opened. If the bleeding persist, rounds of agaric, dipped in Commander's balsam, should be applied. When the blood bubbles up by the side of the canula, the wound of the trachea has been made too large, so that the blood gets entrance during inspiration. A larger canula should at once be substituted. When the operation has been a laborious one, *emphysema of the neck*, sometimes extending to some distance, may be met with. It usually results from a want of parallelism between the cutaneous and the tracheal wounds. Ill-repressed movements of the child may have displaced the trachea, or too great a delay in introduction of the catheter may have favoured the passage of the air into the cellular tissue. The same result may occur from the tracheal wound being too large or the canula too small. Frictions and shampooing the emphysematous region should be employed.—*Brit. and For. Med.-Chir. Rev.*, July, 1863, from *Bull. Gén. de Thérap.*, No. ix.

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29. *Intra-orbitar Aneurism cured by Ligature of the Carotid after Failure of Digital Pressure.*—Mr. ERNEST HART relates (*Lancet*, March 15, 1862) the following unique case of traumatic arterio-venous aneurism of the frontal branch of the ophthalmic developed within the orbit:—

Richard T——, boy, aged 11, quarrelling in the street with another lad, received a blow from the forked end of an iron rib of a parasol at the inner angle of the left upper eyelid, about four years since. Rapid swelling of the eyelid followed. In a few minutes a considerable effusion of blood into the eyelid had occurred. It swelled to the size of a pigeon's egg, and became purple in colour, altogether obscuring the eyeball, since the lid could not be raised. The wound bled very freely. By the aid of pressure the bleeding was arrested. Subsequently, under the influence of time, cold lotions, and leeches, the swelling of the eyelid subsided, the eye remaining somewhat bloodshot. No ill effects were apparent.

The boy returned to school, and went on as usual. He used to complain afterwards of headache and singing in the ears; but it was not until the end of 1860 that the attention of his mother was drawn to a swelling in the site of the original wound of the lid, which beat with a perceptible pulsation. This gradually increased in size; the lid became protuberant, the eye projecting, and somewhat unduly vascular in its conjunctival surface. He was brought to my house on the 19th of January, 1861.

There was an aneurismal swelling at the inner angle of the orbit, just below the margin of the bone; it pulsated strongly. There was a perceptible thrill, and a very loud, whizzing bruit could be heard over all the left side of the head and temple. This bruit was continuous through both systole and diastole, but louder during diastole. Hence I inferred that there was a communication between the artery and vein, and that this was an arterio-venous aneurism, resulting from the transfixion of the frontal branch of the ophthalmic artery and its satellite vein by the forked end of the piece of iron. There was no scar perceptible where the external wound had been. The eyelid was swelled, and some dilated vessels coursed over the ocular conjunctiva of the globe, which was itself more prominent than that of the opposite side. The general health of the lad was good. He complained of a whizzing noise in the head, like that of a steam-engine at work, and he suffered from headache.

After causing my diagnosis to be verified by Mr. Erichsen, I resolved to apply digital pressure to the left carotid artery, with the view of obtaining a cure in the same way as we are in the habit of doing in treating aneurism in other parts of the body. Although entertaining the highest opinion of the capabilities of this always innocuous treatment, I had not any great hope of its success in this case. That method is most effective to cure where a definite sac or diverticulum of the blood exists, and where, by retarding the circulation, the deposition of layers of fibrin on the roughened walls of the sac may be obtained. Here, however, there was but a small sac, situated between the artery and vein, and communicating with both. I had put the boy under chloroform to facilitate the perfect examination of the aneurismal disease; and by passing the finger between the eye and the roof of the orbit, it could be felt that the projection at the angle was due to an enlarged and tortuous coil of artery, and that the artery was tortuous and dilated along the roof of the orbit. Here, then, was a case of arterio-venous aneurism, with the cirsoid dilatation of the artery, and probably also of the vein, which commonly accompanies that disease. In such a case there is no roughened sac; the arterial blood passes by a smooth aperture into the vein: and these are conditions under which it is almost hopeless to expect that indirect pressure will effect a cure—almost hopeless, but not quite. I felt it right, therefore, to employ digital pressure on the carotid during three weeks, organizing for that purpose a staff of three persons, who maintained intermittent but complete pressure during several hours daily for that period. It was very easy to stop pulsation in the projecting tumour by pressure on the carotid, and the arrest of the pulsation always afforded the visible sign that the pressure was complete. In cases of true aneurism, some surgeons have thought it desirable that the pressure should be continuous and incomplete, allowing a small stream of blood to flow through the tumour and deposit its fibrin. In arterio-venous aneurism I have no doubt that it should be intermittent and complete, for here the object is, by stopping the flow of blood from the artery into the vein, to seal in the first instance the aperture of communication. If this complete pressure be not intermittent, faintness follows from the interference with

the circulation of the brain. This boy always bore fifteen minutes of pressure well. At first we all thought there was a marked improvement; and the boy said he did not suffer so much in the head. However this may have been, at the end of three weeks there was much the same state of things as before. After some consideration I resolved to tie the common carotid artery, as offering the best means of cure.

In March, I operated, in the presence of Mr. Erichsen, Mr. T. Holmes, Mr. Walter J. Coulson, Dr. B. W. Richardson administering the chloroform. The operation lasted but a few minutes, and neither the vein nor nerve was seen. The ligature of the common carotid immediately caused the flattening of the pulsating tumour, and an entire cessation of its beat. On recovering from the chloroform, the boy was calm and sensible: there was no perceptible change of temperature in the heart, or in the eye, or in the neck. He slept well that night, and the most remarkable point in all the after-progress was the total absence of any symptoms which could have led to the supposition that the great artery of the neck had been tied, or that anything had been done to interfere with the circulation of the brain. The ligature fell on the eighth day. The patient was seen during his convalescence by Mr. Erichsen and Dr. Richardson. The only point to be noticed was, however, the absence of symptoms.

Looking at the frequency with which ligature of the carotid has produced the gravest symptoms of brain disorder, and the occasions on which it has been followed by softening of the brain, paralysis of the opposite side, and death, I was disposed to think—and it was also the impression of Mr. Erichsen—that this boy had a great advantage in that the collateral circulation had been developed previously by digital pressure, and the sudden diversion of the blood was hence attended with little or no shock to the brain. It was in this hope that I persevered in the use of digital pressure before the operation, after it was evident that it was not likely itself to effect a cure. I think it may perhaps be recommended that this preliminary measure should in future always be adopted, if only with that view.

The final result of the ligature has, in this case, been satisfactory. There is not, at the present time, any trace of the tumour, or pulsation at the angle of the eye. The sight is perfect. He has no pain or noises in the head; he runs about, and is clever at his book. There may be heard, by applying a stethoscope to the head, a whizzing bruit. This has been noticed in other cases after cure, but it has not affected the permanency of the cure. I attribute it to the retrogressive dilatation of the arteries which had occurred during the progress of the disease. This slightly cirsoid condition will probably remain.

In the following table may be seen a list of the recorded cases of intra-orbitar aneurisms treated by ligature of the primitive carotid, with the result:—

| Author. | Date. | Result. |
|---|---|---|
| Travers | 1804 | Successful. |
| Dalrymple | 1812 | Successful. |
| Roux | 1829 | Success incomplete. |
| Scott | 1834 | Successful. |
| Busk | 1835 | Successful. |
| Jobert | 1839 | Successful. |
| Velpeau | 1839 | Success partial. |
| Van Buren | | Successful. |
| Herpin | 1844 | Successful. |
| Pétrequin | 1845 | Death. |
| Brainard | 1852 | Unsuccessful. |
| Curling | 1854 | Successful. |
| Nunnely | 1852 | Successful, sight gone. |
| " | 1856 | Successful. |
| " | 1858 | Death. |
| " | 1859 | Successful. |
| Bowman | 1859 | Death. |
| " | 1860 | Successful. |
| Syme | 1861 | Successful. |
| Hart | 1861 | Successful. |

It will thus be seen that the statistical results of the operation are not unfavourable, considering the magnitude of the vessel ligatured, and its importance to the nutrition of the brain. Out of the twenty cases which are here tabulated, in three cases the ligature of the common carotid was followed by death. In two the success was incomplete. In a sixth case the pulsation of the tumour was unabated by the operation. There remain fourteen successful cases out of twenty.

Mr. Hart attaches great importance to the treatment by compression of the artery leading to the aneurism, and he cites two cases in which this plan was carried out most successfully. If this plan has not been earlier applied to the treatment of orbital aneurisms, the explanation must probably be found in the fact that continued instrumental compression of the carotid artery in the neck is a proceeding of almost insurmountable difficulty. Since Professor Vanzetti, of Padua, has perfected the application of digital compression, this difficulty no longer exists. Digital pressure was maintained in the case of R. T—— without inconvenience. It failed to effect a cure, but it probably modified favourably the condition of the tumour, and developed usefully the collateral circulation of the brain. In the first case, that of Maria O——, treated by Professor Gioppi, of Padua, the cure was effected by compression for a few hours in four days; in the other case, that of Catharina B——, treated by Dr. Scaramuzza, of Verona, by intermittent compression occupying seven hours and twenty minutes in the course of eighteen days. It may perhaps serve to show how slowly the news of surgical progress may reach even the best-informed quarters that no reference whatever is made to these cases in Mr. Nunnely's paper in 1859, nor does this surgeon mention the probability of effecting a cure by this simple means.

Case 1. Maria O——, aged 42, entered the clinique of the hospital of Padua, July 4, 1856. She was of feeble constitution. Seventeen days previously, during an effort of childbirth, she felt as though her eye had started from the orbit. Four days afterwards the lids and globe of the eye were immovable, and there was complete blindness. On admission, the aspect of the patient was frightful. The eye lay motionless on the cheek; the pendulous lid was red and livid; the cornea infiltrated and opaque; blindness complete. There were pulsatory noises in the head, and the finger, when pressed back at the upper border of the orbit, felt an elastic aneurismal tumour thrusting forward the eye. Compression of the carotid very soon produced faintness, and Gioppi employed the method of Valsalva, fearing to use ligature. It failed. Digital compression was then employed for a minute or two at a time, suspending it when faintness threatened. This compression was effected with the finger by the patient herself, and some of the convalescents and others in the ward. The effect was of the happiest kind. On the following day there was already a diminution in the force of the pulsations; and at the end of the fourth day all pulsation had ceased. From that time all went well. Finally, the eye retreated within the orbit and sight returned, the patient remaining only somewhat myopic and with a dilated pupil.

Case 2. Catharina B——, of Verona, a washerwoman, aged 49, small and weakly, was admitted into the eye ward of the civil hospital of Verona on April 4, 1858. She was weak in health and subject to palpitation. A few days previously, after a violent access of fever, she felt an acute pain in the left orbit and ear; something seemed to give way in the orbit; the eye became enlarged, and the patient could not distinguish light from darkness. On her admission, the left eye projected entirely beyond the orbit; the lids did not cover the ball; the eye red; cornea dull. The patient could hardly discern the light. There was pulsation and thrill over the orbit and left temple. She was the subject of dilatation of the heart and of the arch of the aorta. Digital compression of the carotid was therefore employed here very cautiously, for not more than five minutes at a time. Summing up briefly the carefully recorded details of the case, it may be said that during the eighteen days that the treatment lasted, the space of time during which compression was used amounted only to seven hours and twenty minutes. The eye had then entirely entered the orbit, and pulsation had ceased. The cure was complete.

30. *Popliteal Aneurism cured by Digital Compression.*—Mr. GEO. SOUTHAM read before the Royal Med.-Chirurg. Soc., June 23, 1863, a case of this. The patient was in his thirty-third year, an iron moulder by trade. From the man's account the disease did not appear to have been of more than nine or ten weeks' duration. He was admitted into the Manchester Hospital on the 29th of December, 1862. The right popliteal space was distended by a pulsatile swelling, accompanied by severe pain and general œdema of the leg. The pulsation of the tumour was very perceptible, but feeble, and the skin over it slightly discoloured. His countenance bore indications of severe suffering. Pulse 120, small and quick; appetite bad. So urgent did the case appear that clamps were immediately applied over the femoral artery. The limb was enveloped in flannel bandages, and elevated on pillows; bottles of hot water were placed near, to raise the temperature of the foot and leg to the natural standard. The following day the clamps were removed, as they had produced redness and vesication of the skin. Iodide of potassium was now prescribed, and regularly taken until the 20th of January, with no apparent improvement. Digital compression was then resorted to, twelve students of the institution having volunteered their services. During the first twenty hours this system of pressure was frequently interrupted, and therefore at the end of this period the pulsation had apparently undergone no change. Consequently, two students were directed to be continually with the patient, one to compress the artery, the other to apply his hand over the aneurism to detect any insufficiency of the pressure. This plan was adopted for twenty-four hours: a very slight pulsation only could then be felt in the tumour, and six hours later it had entirely subsided. Moderate pressure was, however, kept up for another day, and then discontinued, as there were no signs of any further pulsation. From this time the case proceeded very satisfactorily, the man leaving the hospital at the end of three months, with scarcely any remaining trace of the disease.

Mr. Southam considered that pressure must now be regarded as the established system of treating aneurismal tumours whenever practicable; but the best mode of applying it is still a subject for discussion. In the present case the vitality of the limb was evidently too much impaired to admit of the application of instrumental pressure; indeed the unusual size of the tumour, the unsatisfactory condition of the surrounding parts, as well as the patient's general health, formed in themselves serious obstacles to any kind of operative interference. Many are the advantages of digital over instrumental compression. Not only does it seem to effect a cure in a shorter period of time, but with much less pain, and is not so likely to lead to sloughing of the structures under pressure, which with the greatest precaution is liable to occur in some cases. The flow of blood through the aneurism may not be so effectually prevented by this means, and indeed this is not to be desired, as fibrillation of the blood is more likely to occur, and to be more permanent, if allowed to pass through the sac in small quantity and in a slow continuous stream; for digital compression is not liable to those sudden alternations in force and volume which under instrumental pressure are apt to take place in consequence of the tendency of the artery to escape from under the clamps on any slight movement of the limb. But pressure alone must not be entirely relied on in the treatment of aneurism; for as success depends on the consolidation and subsequent absorption of the blood in the tumour, other agents of similar properties, to combine with, must be sought for. The difficulty in arriving at correct views of the medical treatment of aneurism is probably owing to our imperfect knowledge of the changes which contribute to the solidification of the aneurismal contents.

The process is usually regarded as similar to the coagulation of the blood out of the body; but it is questionable if this be exactly so where the solidified material is partially absorbed or converted into structure. Ordinary coagulation of the blood is one consequence of its diminished vitality, and therefore would more likely be followed by its removal from the body by ulceration and suppuration than by absorption. It seems, therefore, highly probable that the solidification of the blood within the body, previous to its absorption or conversion into tissue, differs somewhat at least from that of ordinary coagulation. This may explain how it is that low diet, which by depressing the vital proper-

ties of the blood should promote its coagulation, has not led to those salutary results expected by its advocates in the treatment of aneurism.—*Lancet*, July 18, 1863.

31. *Treatment of Ulcers of the Extremities of the Legs by "Sealing."*—Mr. BARNARD HOLT has adopted in the Westminster Hospital, with good results, a novel mode of treating ulcers of the legs. The treatment consists in excluding the air from the wound during the process of granulation, and this plan is found to assist materially in rapid cicatrization, when once a healthy action is set up.

The method of applying the dressing, as practised by Mr. Holt, is as follows: The margin of the ulcer is covered with adhesive soap-plaster, half an inch wide, and a piece of oil-silk, large enough to cover both the ulcer and the plaster, having been carefully affixed by means of collodion, another edging of plaster is put on the margin. The transparency of the oil-silk allows the progress of the ulcer to be inspected with the greatest ease.

In some clinical remarks upon cases under treatment by this method, Mr. Holt observed that "to render the treatment effective it was necessary to remove the sealing in accordance with the amount of discharge present. When the discharge is abundant, it may be necessary to remove the first sealing on the second day; but experience shows that, as the treatment is proceeded with, so the discharge gradually diminishes in quantity, and that the granulations which before the sealing were pale and flabby, become florid and vigorous. Hence, the second application of the sealing may usually be allowed to remain untouched for five or six days, and the third even longer, and so on until cicatrization is complete. No dressing of any kind is required beneath the oil-silk, which should be carefully secured, so as to exclude the air. By this simple method all irritating influences are avoided, the discharge is not too frequently removed, and the growth of healthy granulations is induced, leading to the rapid cicatrization of the ulcer.

We subjoin two cases illustrative of the treatment:—

CASE 1. William J., aged 22, a sailor, admitted June 24, into Northumberland Ward, under the care of Mr. Holt, with an ulcer of the leg.

*History.*—About three years since, whilst on board ship, his right leg was crushed by some spars which fell upon it, and for twelve months after this, pieces of bone came from the wound, which then healed up, and was quite well for six weeks. It then broke out into an ulcer again, and continued to enlarge up to the time of his admission.

On admission there was an inflamed ulcer on the outer side of the right ankle, about two inches long and one inch wide, but not very deep. There was considerable inflammatory swelling of the surrounding parts, and he complained of burning, pricking pain in the ulcer itself. Ordered a linseed-meal poultice and, a couple of days afterward, a nitrate of silver lotion (gr. ij and ℥j).

*July* 1. The ulcer was sealed.

4*th*. Unsealed, and found to be diminished in circumference half an inch; resealed.

7*th*. Dressings renewed. Discharges a good deal.

10*th*. Ulcer much diminished in size.

14*th*. Ulcer healing rapidly, and of very small size.

25*th*. Discharged cured.

CASE 2. Martha B., aged 22, a servant, admitted June 24, into Percy Ward, under the care of Mr. Holt, with ulcers of the legs.

*History.*—On December 28 last, she received a blow on the left leg, which gathered and was poulticed, and a large slough separated, when lotio nigra was applied. The ulcer continued to increase in size, and an ulcer appeared on the right leg without apparent cause, about three weeks before her admission.

On admission there was an ulcer on each of the legs immediately below the patella. The largest, on the left leg, was of the size of the top of a small teacup, whilst that on the right leg was of the size of a two-shilling piece. They were both very deep, with ragged edges, and discharged freely. Ordered linseed-meal poultice.

*June* 26. Ulcers more healthy in appearance, and less painful. ℞.—Acidi nitrici dil., ♏xv; decocti cinchonæ, ℥j, ter die.

27*th*. The depth of the ulcers much decreased, and their size diminished. The one on the left leg is about the size of a five shilling piece, and that on the right about the size of a shilling. Both ulcers were "sealed" according to Mr. Holt's method.

30*th*. Left ulcer of the size of half a crown, and the right of a sixpence. Ulcers re-sealed.

*July* 10. Ulcers unsealed, and found to be much smaller. The same dressing applied.

14*th*. The left ulcer of the size of a shilling, and the right completely healed.

29*th*. Discharged.—*Med. Times and Gaz.*, Dec. 6, 1862.

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32. *Case of Strangulation of the Stomach in an Umbilical Rupture; Death during its Reduction under Chloroform.*—An account of a case of this, believed to be unique, was read before the Royal Medical and Chirurgical Society, by Mr. CHAS. H. MOORE (June 23, 1863). A corpulent woman, aged sixty, was admitted into the Middlesex Hospital, under the care of Mr. Moore, with a strangulated umbilical hernia fourteen inches in diameter. She had been operated on for strangulation ten years before, by Mr. Wormald. She was greatly exhausted, having been vomiting six days and constipated three days, and having taken calomel and been leeched and blistered. She had vomited two gallons of fluid in the previous forty-eight hours. The pulse was 120.

A drachm of chloroform and four successive portions of forty minims each were inhaled during eleven minutes. The taxis was employed, and was twice interrupted—once by her coughing, once by vomiting. It was continued four or five minutes after the inhalation of chloroform was discontinued, and until about one-third of the hernia had been reduced. She was then so feeble that all but restorative measures were stopped; in four minutes more she was dead. Pulse and respiration continued uniformly and failed proportionally until both ceased.

The cardiac and pyloric ends of the stomach were in the abdomen; the intermediate portion was fixed and constricted in the hernial ring. The cardiac portion was flaccid and empty, but was of enormous capacity. Many parts of its mucous membrane were gangrenous and black, and some were lacerated. These lacerations bore a definite relation to the œsophageal opening. The peritoneal coat near the spleen was also ruptured, and the back of the cardiac pouch was in one spot completely perforated. About a gallon and a half of black liquid, similar to that which had been vomited, lay in the peritoneum. This membrane was not inflamed, but the aperture through the stomach was partly black and pulpy, partly inflamed, partly infiltrated with the contents of the stomach, and a little ecchymosed.

The writer commented, 1st, on the unique character of the case—a complete strangulation of the stomach itself. None of the black fluid had passed into the small intestines, which contained air and a little yellow bile. 2d. On the dilatation of the cardiac portion, to the inordinate distension of which he attributed the gangrene. 3d. On the rupture of the stomach. The lacerations might have been traced to the taxis, had there been any mark of violence in the portions of the stomach within reach during that operation; but these seemed proved, by their radiated disposition with regard to the œsophagus and by the pathological changes in the principal rupture, to be due to vomiting. The perforation of the stomach might have been almost entirely produced by the vomiting, but might have been completed by the taxis. 4th. On the cause of death. The importance of the case in respect to the toxical effects of chloroform and to the supposed sudden fatality of ruptures of the stomach was considered, and reasons were offered for assigning the result to neither separately, but to both, in common with the previous and great exhaustion of the patient. Finally, it was suggested that the stomach-pump might have relieved such a case with less danger than was involved in the use of chloroform and the taxis, though actual recovery was in the highest degree unlikely.—*Lancet*, July 18, 1863.

33. *Superiority of Vulcanized Caoutchouc over any other Substance for the fabrication of Bougies.*—Professor NELATON maintains the superiority of vulcanized India-rubber for catheters and bougies over the instruments in common use made of tissue coated with oil mixed with litharge. The latter, he says, are rigid, liable to give rise to false passages, cause pain, and when permanently left in the urethra, exercise a degree of pressure which may induce mortification and perforation. In a few days, moreover, they are deteriorated by humidity. Vulcanized India-rubber sounds, on the contrary, are perfectly flexible and unchangeable. They are inserted with greater ease, and cause so little distress, that they may be preserved in the urethra during a journey without inconvenience. They are not affected by moisture, and one of these instruments which remained in the urethra twelve days, in one of M. Nélaton's cases, when withdrawn presented no sign of outward injury, and was as smooth as before its introduction.—*Journ. de Méd. et Chir.*

## OPHTHALMOLOGY.

34. *A Lesion of the Conjunctiva coinciding with Hemeralopia.*—In a recent report on hemeralopia, M. Gosselin noticed the fact of slight blepharitis or conjunctival catarrh being connected with the night-blindness assisting to explain its epidemic character, its persistence in the same regiments, and its recurrence in the same men. In the present paper, M. BITOT indicates the coincidence of hemeralopia with a lesion of the conjunctiva, occupying not the lids, but the globe of the eye, and not exhibited by signs of inflammation, but by an assemblage of shining white spots, producing a pearly or silvery spot by the side of the cornea. The author has made his observations in twenty-nine cases occurring in the Bordeaux Children's Hospital, nineteen being males and ten females; the ages varying from nine to nineteen years, these children being employed as tailors, shoemakers, and dressmakers. The lesion has been always found near the lateral part of the cornea, generally on the external side. The spot, of a pearly or silvery appearance, seems constituted of an aggregate of minute points, and may vary in form not only in different individuals, but in the two eyes of the same person. In general, it is triangular, having its somewhat concave base turned towards the cornea. The form is susceptible of undergoing change when pressure is made on the eyelids, the parts constituting the spot being simply in juxtaposition. The extent of this spot is proportionate to the completeness of the hemeralopia, and at the commencement of the disease only a few pearly points are visible. In some cases these have furnished the first indication of the approaching hemeralopia, the patients not being aware then of any disturbance of their vision. The course of the spot follows that of the hemeralopia, increasing in size as this becomes more complete, and diminishing slowly or rapidly, according to the rapidity of the cure. Not a trace of the spot remains visible when the normal vision has become restored. The existence and duration of the spot thus become a measure of the principal disease; but before concluding this to be case, M. Bitot examined the other children of the establishment, in order to ascertain whether its presence might not be a mere coincidence due to the lymphatic or scrofulous constitution so prevalent there. On examination, however, the subjects of hemeralopia were found to be some of the most healthy children, while cases which exhibited marked scrofula, independently of hemeralopia, never manifested the spots in question. These spots cannot be detached by the finger-nail, but seem to consist of epithelial layers. The conjunctiva situated between them and the external angle of the eye, loses its normal characters. It is less moist, soft, shining, and pliable, and pressure made by means of the eyelids, exhibits a very clear line of demarcation between its changed and healthy portions.

[M. Villemin, an army-surgeon, states,[1] without having been aware of

[1] Gazette Hebdomadaire, No. 21.

M. Bitot's investigations, that he had met with this white spot in an epidemic of hemeralopia occurring in a battalion stationed at Strasbourg in 1860.]—*Brit. and For. Med.-Chir. Rev.*, July, 1863, from *Bull. de l'Acad. de Méd.* No. 14.

35. *Loss of Sight from Decayed Teeth.* By Mr. H. T. KEMPTON.—Case. The patient was a gentleman, aged forty-two, of a highly nervous temperament. At the time he first visited me he was suffering from pain extending over both sides of the head and face, incapacitating him from attending to his profession, and depriving him of rest at night. The sight of both eyes was affected, but more particularly that of the right. The patient had been under treatment since June last. On examining the mouth I found there was extensive inflammation on both sides of lower jaw, owing to the presence of two decayed teeth. On the right side the first molar was considerably decayed and the pulp cavity exposed, so that on introducing a small instrument it gave rise to a violent paroxysm of pain. The tooth was somewhat loose in its socket, owing to the inflammation having extended to the periosteum. Subsequently, upon extracting this tooth I found a small sack filled with pus attached to the fangs. On the opposite side, the second molar was in much the same state, but the inflammation not so acute.

In the upper jaw all the teeth were sound.

In consequence of the pains about the head and face, I extracted the two decayed molar teeth in the lower jaw. This proceeding not only afforded relief to the patient's sufferings, but was afterwards attended by such a marked improvement in the power of vision, that there can be no reasonable doubt that the teeth had been the primary source of the eye affection. The history of the case will, however, be best understood from the following account given me by the patient himself:—

"It may be necessary to remark that for some months previous to becoming a sufferer from toothache, I had worked hard at mental employment, and my nervous system was in a very sensitive and excitable state. My lower limbs, particularly, felt as if they were *partially* paralyzed; or rather, I should say, when at all tired I was to some extent unable to control them.

"In May last I visited the North of England, and while there suffered severely from what I then believed to be tic douloureux, but now concluded to have been toothache. It commenced on the left side of the lower jaw, doubtless from the pressure of the wisdom tooth upon the decayed tooth lately extracted. The pain I endured was excruciating, and was not confined to the lower jaw, but spread entirely round the face, and was at times acute in the ears and about the temples.

"On returning to London, I suffered greatly from pains in the teeth on both sides of the lower jaw, but found that the right ear and temple were more affected thereby than those on the opposite side.

"At length, about October 14th, I suddenly found that the sight of my right eye was all but gone. Attributing this to cold, I, as I now believe, very improperly, applied a warm poultice overnight. On the following morning I found my sight by no means better, and after foolishly dallying for a week or more, was advised by a friend to go to the Ophthalmic Hospital, which I did, and explained to the surgeon, Mr. Jabez Hogg, that I had been suffering from the toothache as I have previously described. He at once prescribed for me, and said that if I valued the sight of my eye, the offending tooth must come out. I accordingly went to a dentist to whom I had been recommended, and told him that I must leave him to judge which tooth it was, as owing to the general pain in the teeth in the locality (the right side of the lower jaw) I really could not fix upon it. He selected the wisdom tooth, which Mr. Hogg subsequently told me was the wrong one, and pointed out the tooth afterward extracted by yourself, as the source of my sufferings. Under the skilful treatment of Mr. Hogg, the sight of my eye has been and is gradually improving; but there are one or two points, which although doubtless well understood by ophthalmic surgeons, have seemed to me very curious.

"I observed that while, by the improvement of the sight of the affected eye

I was enabled dimly to distinguish the furniture and windows of a room—the fire, which I should have thought would have been the clearest object of all, was quite invisible, and simply conveyed the impression of a black space. While this was the case, I could nevertheless faintly distinguish the smoke ascending the chimney. As the vision continued to improve, I was gradually enabled to see the light proceeding from the fire—although the absolute heated coals and flame were still invisible to me. These, together with gas-lights and the flames of candles, are now becoming distinguishable.

"I may further observe, that on closing the eye, while it was yet all but insensible to external objects, I could see various beautiful patterns, consisting of numerous combinations of gold or orange-coloured carved lines on a dark ground.

"As the sight gradually improved, these patterns became replaced by stars of a like colour on a similar dark ground—and finally both patterns and stars disappeared."—*Ranking's Abstract*, vol. xxxvii., from *Dental Review*, January, 1863.

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36. *Amaurosis following Parturition.*—Dr. Eastlake communicated to the Obstetrical Society of London (April 1, 1863) a case of this. This phenomenon had occurred on seven previous occasions under the same conditions, but it did not appear after the first labour. The patient was married, and thirty-four years of age. The blindness, which was total, occurred in both eyes suddenly about the third day after the birth of each child, and lasted on an average from three to five weeks. The patient had never lost more than the normal quantity of blood; she had never taken ergot; there was no suppression of the milk or lochia, nor was the urine albuminous. A careful ophthalmoscopic examination had been instituted, but the evidence adduced was entirely negative. Dr. Eastlake regarded the case as unique, and concluded his paper by stating that the only author who had described any case at all similar was Beer, in his "Lehre der Augenkrankheiten."—*Lancet*, May 30, 1863.

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37. *Amaurosis following Tobacco-smoking.*—M. Sichel observes, that among cerebral amauroses there are two forms but little known. One of these observed in drinkers, he himself described as symptomatic of delirium tremens several years ago. The other, due to the use of tobacco, and first indicated by Mackenzie, he once doubted the existence of. Subsequent experience has, however, convinced him of its reality, so much so that he is now of opinion that there are few persons who have smoked during a long period more than five drachms of tobacco per diem, without having their vision and frequently their memory enfeebled. Both these forms of amaurosis are characterized by the absence of well-marked symptoms of cerebral congestion, the symptoms vibrating between those of sthenic and asthenic amaurosis, and the surgeon remaining in uncertainty as to their seat and nature until the special cause is discovered. The ophthalmoscopic symptoms, as in most old cerebral amauroses, are negative or slight, and common to other cerebral amauroses. These two forms of amaurosis, like all affections dependent upon an inveterate habit, are very refractory to treatment. Generally, the two forms are observed separately, but it is not rare to find them united, and it then becomes difficult to assign the respective shares to the alcohol and tobacco in the production of the amaurosis. M. Sichel relates an interesting instance of this combination, remarkable for yielding in so short a period as six weeks, while from three to twelve months are usually required to effect amelioration in these cases. In treating them, discontinuance or diminution of the habit is a great and a difficult desideratum. Depletion, even local, should be employed with the greatest caution; and stimulating liniments or flying blisters may aggravate the symptoms. A purgative, consisting of equal parts of magnesia and cream of tartar, is an excellent means when the function of the stomach is active, alternating it with pills of gum ammoniac and aloes; but in the disordered stomach of drinkers, small doses of rhubarb and magnesia, given twice a day, one hour before meals, form a good corrective. Bathing the eyes and forehead with cold water, irritant pediluvia, and dry cupping or flying sinapisms applied to the extremities, are

excellent adjuvants. In M. Sichel's case, an ointment composed of one part of the black oxide of copper, and ten parts of lard, was applied to the temples, and was succeeded by flying blisters. M. Mercier, in corroboration of the unsuspected effects of tobacco in generating disease, related a case in which a cough, which had persisted for a year, and purpura, which had lasted for seven months, soon yielded after the cessation of smoking, which had been excessive. His own practice has furnished him with full proof of the depressing effect of this agent upon the generative functions.—*Brit. and For. Chir. Rev.*, July, 1863, from *L'Union Médicale*, No. 54.

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38. *Action of Calabar Bean on the Iris.*—In our previous number (p. 265), we noticed some very interesting observations relative to the action of the calabar bean on the iris, and we are now enabled to present some further investigations with this substance.

Dr. GEORGE HARLEY read (June 9th, 1863) before the Royal Medical and Chirurgical Society, a paper on the subject.

The following are his conclusions: 1. The ordeal bean may cause contraction of the pupil when taken internally as well as when applied locally. 2. That atropia and the calabar bean are physiologically antagonistic. 3. That the ordeal bean paralyzes the motor nerves, and leaves the intelligence and muscular irritability unimpaired. 4. That it excites the salivary and lachrymal secretions. 5. That it destroys life by paralyzing the nerves supplying the respiratory muscles—being, in fact, a respiratory poison. 6. Although it may weaken the heart's power, it neither stops the circulation nor arrests the heart's action. It is not, in fact, a cardiac poison. 7. It is closely allied in its effects to woorara and conia, most closely, perhaps, to the latter; but it differs from both in its tendency to produce muscular twitchings, and in its power of inducing contraction of the pupil. Neither woorara nor conia exert generally or locally any such effect on the iris. 8. The ordeal bean will prove a most valuable addition to the pharmacopœia, by not only giving us a useful myopic, but also a powerful anodyne, capable of soothing nerve-irritation without either destroying intelligence or endangering life by arresting the heart's action.

Mr. SOELBERG WELLS was somewhat surprised that, in enumerating the peculiar properties of the calabar bean, Dr. Harley had not called more attention to its singular power of causing contraction of the ciliary muscle, and thus affecting the accommodation of the eye, as this was of far greater importance than its action upon the pupil. The impairment of vision which follows the application of atropia is not due to the dilatation of the pupil, but to the paralysis of the accommodation. This is proved by the fact, that if we employ a sufficiently weak solution of atropia, so that the constrictor pupillæ alone, and not the ciliary muscle also, is paralyzed, vision will be but very slightly impaired. Now the calabar bean possesses the peculiar power of not only causing contraction of the pupil, but also of the ciliary muscle, thus changing the normal into a short-sighted eye. It also counteracts the paralyzing effects of atropia upon these muscular structures. In a case of rheumatic paralysis of the constrictor pupillæ and of the accommodation (ciliary muscle) of the eye, which he (Mr. Wells) published in the *Medical Times and Gazette* a few weeks ago, the action of the calabar bean was fully illustrated, and its power of causing contraction of the paralyzed parts traced step by step. With reference to this case, he might state that it was now all but cured, the pupil having almost regained its normal size, and vision being nearly perfect. He would not, however, attribute too much of this good result to the effect of the calabar bean, as it was well known that such cases of paralysis of the pupil and the accommodation, more particularly when they occurred after severe illness, often got well of themselves when the patient's health improved. He, however, believed that in this case the calabar bean considerably accelerated the cure. With respect to the local action of the bean, he might remark, that Professor Czermak and he had been trying its effect upon the eyes of rabbits, directly after decapitation, and that they had found that it produced marked contraction of the pupil within about twenty minutes of its application. He was, however, still engaged upon these experiments, and had hoped to have concluded them before the reading of Dr.

Harley's paper before this Society, which he had not expected until the next meeting.

Mr. J. W. Hulke communicated briefly the results of three experiments which had been made with the alcoholic extract of the bean on patients under his care at the Royal London Ophthalmic Hospital, by Mr. Workman, the House-Surgeon. The first patient, a sailor, had paralysis of both third (cranial) nerves, and mydriasis from syphilitic periorbitis. Two hours after the application of the extract to the right eye, the nearest point of distinct vision was sixteen and a half inches, and the diameter of the pupil was one line, the proximate point having been previously twenty-six inches, and the pupil two and a half lines broad. In the same time the near point of the left eye had become twelve and a half instead of twenty inches, and the pupil one line instead of three lines across. The second patient had paralysis of the left third cranial nerve, with mydriasis, of four years' duration, the consequence of traumatic periorbitis with abscess. In one hour the proximate point had become six instead of eight and a half inches, and the pupil had contracted from three to three-quarters of a line. In the other unaffected eye the application of the extract effected in the same time an alteration of the proximate point from eight and a half to four inches, and reduced the pupil from one and a half to three-quarters of a line. The third was a case of paralysis of the left third cranial nerve, with mydriasis from periorbitis, possibly rheumatic, which had been twice previously cured with iodide of potassium. In an hour the proximate point of distinct vision was brought from ten to five inches, and the pupil changed from three to three-quarters of a line in diameter. Mr. Hulke thought these cases confirmed generally the statement of Dr. Robertson, who was entitled to great credit from his practical inquiry into the physiological action of the bean on the eye.—*Med. Times and Gaz.*, June 20th, 1863.

These results are also confirmed by M. Giraldes, Professor agrégé of the Medical Faculty of Paris, who has communicated to the Academy of Sciences and Academy of Medicine the results of his experimental investigations. The results of his experiments he states (*Bull. Gén. de Thérapeutique*, July 15, 1863), to be as follows:—

"On eight children, of the ages of three, four, six, twelve, and thirteen, whose pupils were normal, one drop of a solution of the extract of glycerine, placed under the eyelids with a fine brush, caused evident contraction of the iris in a few minutes; the pupils were sensibly diminished; in from fifteen to twenty minutes this contraction had reached the maximum, and the pupils had scarcely the diameter of half a millimetre (about one-fifth of a line). In several of these children the pupil had been dilated that morning by atropia, and this dilatation was complete at the time of the experiment (with calabar bean); twenty minutes afterwards the size of the pupil was reduced to the minimum. These observations were confirmed by my colleagues, MM. Roger and Debout, and by M. Reveil, Pharmacien in Chief to the Hospital, as well as by all those gentlemen who attend the wards. Twenty-four hours afterwards the contracted pupil had resumed its previous state.

"The power of producing contraction of the pupil possessed by this substance does certainly afford an application of advantage in many affections of the eye. I have confined myself, in the meantime, to these particulars, purposing to continue my investigations on this important subject."

Dr. Graefe, of Berlin, has also experimented with preparations of the Calabar bean sent to him by Mr. Soelberg Wells, and his results agree entirely with those that have been arrived at by the English observers, and add some new facts to those already established. The effect upon the sphincter pupillæ and the ciliary muscle came on in fourteen minutes if the weak, and twelve if the strong extract was administered; it lasted for two days with the former, and for three with the latter. The maximum of myosis lasts from six to eighteen hours. Another effect is a peculiar change of the faculty of accommodation, which sometimes begins simultaneously with, or a few minutes after, myosis has set in. The chief feature of this is an increase of the state of refraction, which may be expressed by the dioptric effect of a lens from $\frac{1}{15}$th to $\frac{1}{8}$th. At the same time the near point of the eye is nearer than usual. This change of refraction

reaches its maximum about ten minutes after the administration of the bean, and remains so from ten to twenty minutes. After three-quarters of an hour the normal state of refraction is very nearly re-established. It is therefore a true spasm of accommodation, and in this respect Calabar bean is the direct antagonist of atropia. There are other disturbances of optic sensibility, such as macropy, but the ophthalmoscope does not show any disturbances in the circulation of blood in the retina. The effect of the bean upon the ciliary muscle is quite independent from that upon the iris, as in a patient who is deprived of the iris, but is able to see, the effect became just as apparent as in others. The drug acts by penetrating into the anterior camera, and has therefore an isolated action upon the eye, just as atropia; it excites directly the motor nerve-fibres which animate the ciliary muscle and the sphincter pupillæ. In birds, on which atropia has no action, Calabar bean is likewise nearly ineffectual; the same may be said of fishes and amphibia. The only drug which possesses some analogy to the bean is opium.

Dr. Von Graefe also made experiments with Calabar bean after having first administered a solution of atropia. If the dose of the latter has been strong, the effect of the former may be entirely counteracted. But if some time has elapsed after the use of atropia, or if the dose given was weak, the pupil is moderately contracted, and there is a considerable increase of the state of refraction. Atropia acts far longer upon the apparatus of accommodation than Calabar bean; and it may therefore happen that after the effect of the latter has passed off, that of the former may again become apparent. In mydriasis the bean has the same effect as in healthy eyes; and even in glaucoma this may be observed, unless the iris should have already become quite atrophied. In fistula of the anterior camera the effect is far less marked, but not entirely counterbalanced.—*Med. Times and Gazette*, Aug. 22, 1863.

## MIDWIFERY.

39. *Artificial Induction of Premature Labour.*—Prof. Martin's cases forming the subject of a paper in *Monat. f. Geb.* (Jan. and Feb. 1862), were twenty-two in number. In three instances the operation was performed twice in the same individual. Five women were primiparæ, the rest multiparæ. Contraction of some part of the parturient canal was present in twenty cases, in nineteen of which the pelvis was the part contracted. In all these labour cases the antero-posterior diameter was shortened, and in several of them the oblique diameters also. With reference to the indications for the induction of artificial premature labour, the author considers that general pelvic contraction, whether with or without accompanying contraction of one diameter specially, certainly indicates its necessity; but in cases when the contraction is limited to one diameter, unless the degree of the same be very considerable, it is advisable to wait the result of the first labour. It has been found that in some cases, where the antero-posterior diameter has not exceeded $2\frac{3}{4}''$, the result has been successful for mother and child when matters have taken their own course. This may be explained by—1, the smallness of the children and the soft condition of the bones of the first children of rachitic mothers; 2, the powerful nature of the labour-pains in the first labours of such women; 3, by the fact that the oblique diameters being often greatly increased in such cases, room is thereby given for the head to pass through, with its shortest diameter opposed to the part of the pelvis, when the contraction is greatest. On the other hand, in the subsequent labours of rachitic women with such moderate degrees of pelvic narrowing;—1 the size of the fœtus appears to increase in successive pregnancies; 2, the, configuration of the lower part of the uterus is less regular and favourable for the long progress of the labour, in consequence of the pressure it has undergone in former labours between the head of the child and the pelvic bones, and hence the position of the fœtus is not so good; 3, the pains are less regular in sub-

sequent pregnancies. It is difficult to say what precise measurements of the pelvis indicate, or not, the operation. Much depends on the form of the pelvic inlet, whether the projection forwards be in the middle line or not, and on the manner in which the head presents at the inlet. Indications for the operation are also conditions threatening the life of the mother—uterine hemorrhage, placenta prævia, &c. Two instances coming under this head are given, in which there was excessive distension of the uterus with fluid (hydramnios), œdematous swelling without albuminuria, loss of appetite, and insomnia, and in which the operation was had recourse to. A third series of indications have been laid down by various authors, viz., the habitual death of the fœtus in the last months of pregnancy. The only condition with which the author is familiar at present under such circumstances is a dropsical state of the fœtus, with evident affection of the blood-corpuscles, and these have been constantly observed in cases where there is constitutional syphilis in the parents. The proper treatment in such cases is an anti-syphilitic one, and not induction of premature labour.

The period of pregnancy at which the operation was undertaken was as follows: In two cases at the thirtieth week; in one case of extreme pelvic deformity at the thirty-second week; in one case at the same period, when there was a firm, unyielding tumour of the sacrum. Four of these children lived. In five cases labour was induced at the thirty-fourth week, and three of the children lived. In ten cases at the thirty-fifth week; two of the children were still-born, the others lived. The presentations were—in the seventeen cases, cephalic; in four the feet presented; in three cases, position transverse; in two cases there was prolapsus of funis.

The method employed was to select the simplest at first, and this failing to induce uterine action, to have recourse to other more powerful measures. Sucking the breasts by means of an India-rubber apparatus was employed, but with very little result, in three cases. It was never alone sufficient. The colpeurynter was employed in two cases, once after sucking had been tried; in the other case, after fourteen fruitless injections of aqua picea into the uterine cavity. The vaginal douche was employed in twelve cases; only twice did it alone succeed, and three times it was necessary to employ a sponge to dilate the os; in one case it induced hemorrhage. Sponge tents were employed in four cases, always after the vaginal douche had been tried. Active pains and dilatations of os set in in all cases not later than twenty-eight hours after its introduction. Warm water was injected into the uterus, between it and the membranes, in four cases. In the first two the results were satisfactory, but in the other two they were such as to lead the author not to employ this method further. He thinks it not impossible that hemorrhage may be produced by repeated injections after this method, and that air may possibly be introduced. In ten cases the means employed to induce labour was the introduction of a gum-elastic catheter into the uterus. In six of these cases the vaginal douche had been previously employed. In eight cases the interval which elapsed between the introduction of the catheter and the first pains was five minutes to twelve hours. In five of the cases, the pains not being satisfactory during this interval, a second, larger catheter was also introduced. The birth of the children took place in twelve to fifty-two hours; six were born alive; one mother died of metritis. Puncture of the membranes was employed in the two cases when hydramnios was present; both had a favourable result for the mother. The general result arrived at is that the best time for the operation is the thirty-fourth or thirty-fifth week, and that the best method consists in the use of the vaginal douche of warm water, this being followed by catheterization of the uterus.—*Sydenham Society's Year Book* for 1862.

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40. *Anæsthetics in Midwifery.*—Dr. Charles Kidd read a paper on this subject before the Obstetrical Society of London (May 6, 1863). The administration of chloroform, he said, in various kinds of labour has been followed by the very best results; the feeling of hope of relief of pain to the mother continues to be most beneficial, the increasing number of living children now saved, where craniotomy previously was practised, is most encouraging for the future. The

present communication is a sequel to a former one in the *Transactions* of the Society, and the author said it was satisfactory to find that all the leading details of that memoir had been highly appreciated, and since then very fully recognized as to their truth by the chief practical obstetricians of Germany, France, America, Australia, etc., more particularly as to the extreme value of chloroform in cases of malpresentation, or contracted outlet of the pelvis requiring versional delivery; as also in some bad forms of anæmic and epileptic puerperal convulsions, chloroform in tedious exhausting labours after dilatation of the os in women of a "particular age" who marry late in life, etc. etc. The present communication in particular had reference—1. To cases attended with hemorrhage, where the author wished to suggest caution in the administration, as also to obtain the opinion of the Society if hemorrhage be encouraged by chloroform. 2. To direct attention to the serviceableness of chloroform in cases of retained placenta. 3. To the usefulness of alternating the administration of ether with that of chloroform where the pulse sinks, as in some exhausting operations, such as ovariotomy. 4. To the vast advantage of using chloroform in puerperal convulsions. 5. To direct attention to the greater safety of chloroform at present, as we now know the accidents do not occur so much or at all from heart disease as from simple apnœa, as the result of stoppage of the respiratory muscles, like the relaxation or paralysis of other muscles, and to direct the Profession to the extreme value of the "Faradisation" current of these muscles in such accidents, when other means fail to restore the patient. And, first, as to the tendency of chloroform to superinduce hemorrhage in ordinary cases, the author seemed to think the fear of this was not entirely without foundation: it is, perhaps, the only one vulnerable point in the administration, yet the latter can be stopped if hemorrhage is feared or the hemorrhage combated by ergot, stimulants, the use of cold, the "binder," pressure, etc., but according as bleeding continues, it is to be remembered the absorption or endosmosis of the chloroform is slightly increased, if it be still gone on with; though, on the whole, the author is not so much afraid of this condition with chloroform as one of brain congestion, or a state observed occasionally—viz., almost of delirium tremens—in some Hospital patients, or a state leading to the actual effusion in the brain in the worst form of puerperal convulsions; but this latter disease may occur without chloroform at all, and we must not blame chloroform. The author desired it to be known that he now took the most unfavourable as well as the more favourable side of the question, and as a "set off" to the doubtful question of danger of hemorrhage, he was certain that chloroform removed unnecessary and often exhausting pain (for pain, *per se*, is always an evil); it renders "versional" delivery very much more easy, it also undoubtedly facilitates the recovery of the lying-in patient; it lessens pain, which pain often leads to puerperal convulsions. It is not probable at all that chloroform skilfully used ever stops a labour or causes inertia. Dr. Tyler Smith saw one case—we see this stoppage, and inertia, and even many cases of death from syncope during, or immediately after labour, where chloroform was never thought of at all; nor does it cause inflammation. We must not argue from coincidences, or false statistics, or what the author terms it, the always venerable error in medical logic of arguing from a "post hoc" to a "propter hoc;" it is a great charity to give the women in childbirth chloroform; but it too often happens that statistics, old routine, and shallow incongruities, as in other kinds of medical evidence, stand in the way of what is of charity or the general good of the poor patient, or the professional character. The next division of the present paper had reference to the usefulness of chloroform in "hour-glass" contraction of the uterus, and some, if not all, cases of retained placenta. A safe and useful rule (having the approval of the large Dublin Lying-in Hospital and other institutions) is the following: If, in efforts at manual extraction of adherent placenta, the uterus be contracted firmly or in "hour-glass" fashion, the condition of the patient fair, and yet much resistance offered to the hand—but we are anxious to avoid uterine phlebitis—the administration of chloroform facilitates the placenta removal and changes the firm uterus contraction (as in version cases). It is, of course probable in many cases that there may be prostration or inertia; here ammonia must be given, and acts very well with chloroform or brandy. There

is a sort of lying-in room superstition, need it be said, that nothing is right till the placenta and every bit of a placenta is taken away. No doubt retained placenta is fortunately a rare complication in cases of delivery, yet in some 6000 deliveries, 56 of bad hemorrhage and 28 of retained placenta were noted, and one case was mentioned by the author where "portions" of a placenta were removed, and uterine phlebitis thus prevented, twelve hours after a delivery; the removal such as seemed impossible without chloroform. These cases are more common with first children than with post-primiparous births. Chloroform is at least one remedy not to be neglected when the other ordinary measures are under trial. Whether many of these cases depend on inertia, the reader will decide for himself; but a new and better school of obstetrics has arisen within the last dozen years, and since the introduction of anæsthetics, bleeding is not now the remedy for phlebitis or typhus; nor is chloroform so full of danger as supposed or shown by false statistics. The author here related his experience in the analogous depressing operation of ovariotomy, in about thirty of which cases he has assisted with the anæsthetic. He now prefers ether to chloroform, or, better still, to place the patient first fairly under the latter, and continue the anæsthesia with the former; it is not necessary to use very much of ether, but if the pulse should sink, the action of sulphuric ether is very marked in restoring it. If ovariotomy could be performed without one or the other, but with a piece of ice over the linea alba, it might be better still. The chief portions of the operation—breaking down adhesions where they exist, securing the pedicle, etc.—are not very painful, and even the tension of the tumour sometimes stretches the abdominal wall to a thin membrane, devoid of feeling. Chloroform, the author again intimates, should be never given in labour cases before the os uteri has dilated to something like the size of a shilling; before that the woman will bear her "pains" with some philosophy or satisfaction, if not resignation. The narcotism of chloroform is more marked in the early than in the later portion of the labour; but it is here that chloroform "delays a labour," as occasionally complained of. It is a great mistake to begin it too soon, however, no matter what the entreaties of friends, or attendants, or the patient herself may be. Very many of the popular prejudices against chloroform in these cases arise from catching a fact by the wrong handle, as it were, or losing sight of the "Opiferque per orbem" that we boast, the relief from pain in charity that it is our duty and privilege to afford the lying-in woman. Pain, too, is a physiological evil; the sense of pain is confined to the sensorium and sensory ganglia, in which chloroform acts so specially and almost alone. The effort of the uterus to empty itself, on the contrary, is one so little related to these that labour may go on in perfect paraplegia; as in cases where the relations of the spinal and reflex system were totally cut off from the sensorium and ganglia by acephalocysts in the upper portion of the chord. Labour, again, will proceed, though the cervical vertebræ may have been fractured in animals, or in the deep apoplectic coma of eclampsia in women, or in the dead insensibility of drunkenness, all of which explains that pain is non-essential, and that we may have spontaneous uterine or reflex action very perfect indeed, though sensation of pain through the brain be removed. At any rate, the sense of pain as pain, as the woman is aware of all about her, and even of the contractions or rhythm of the uterus, as she might without pain recognize the rhythmic contractions or beat of the heart. She watches, in fact, for the "pain," as she calls it; wonders and reflects that it has lost its agony, and yet the labour progresses as well as if she was in torture; recalling one's rude recollection of the old lines—

> "Remembrance and reflection—how allied;
> What thin partitions sense and thought divide!"

Like the knights of old, and their contending opinions of the colour of opposite sides of the same shield, have been the contending opinions in journals and books as to whether chloroform is dangerous in labour, or delays labour, or leads to hemorrhage. But this diversity is at once explained as to delay—whether the chloroform was given too soon or not; and as to danger, by a heap of errors yet copied from one standard edition of a book into others, as to heart disease and its dangers, etc. Reference was next made to "Puerperal Convulsions,"

and three cases mentioned of fatal puerperal convulsions brought on apparently by the excessive reflex irritability of passing the hand into the uterus to remove adherent placenta. Both affections might have been prevented by use of chloroform, but could not fail to be aggravated by the lancet, still so much esteemed in convulsions. But the day for the lancet is gone by, as for stage coaches, or salivation in syphilis. Again, such convulsions are often the result of intense, long-continued agony, which nothing can lessen so well as skilful and small doses of chloroform. It is probable, as observed by Van der Kolk, that in these and all such cases of convulsions that direct irritation of peripheral ends of nerves (notably in some forms of fits from worms, irritation of external genitals in masturbation, etc.,) is reflected directly back to the medulla oblongata (or cerebellum (?) which probably presides over the organs of involuntary life), much like the impression of molecules of a galvanic telegraph wire, though still purely vital; this direct irritation, by a sort of induction, acting on other roots of nerves lying side by side. Hence we see that passing a hand into the uterus excites convulsions in parts not apparently connected with the uterus, but all which excess of action, as well pointed out by Dr. Tyler Smith, Dr. Murphy, and others, is controlled, for a time at least, by chloroform. We see this every month in tetanus cases also, and various forms of epilepsy as now so admirably cured by Dr. Brown-Séquard by other forms of anæsthesia. In conclusion, the author directed attention to seventeen women with obstructed labour, where the mothers had had in old times previously dead children, or eviscerated children, torn away by hook or crochet, or craniotomy, as related to the Society, but where, by means of version subsequently under chloroform, nine living children, and seven with heart pulsation (but which did not live), were gained for the overjoyed mothers, and the barbarous misery to patient and attendant of pulling the child in pieces or craniotomy saved. Cases of this kind now crowd on us from all parts of Europe, America, Australia. Such is one of the vast benefits of this still underrated and cruelly misrepresented agent, chloroform, which now, as we are aware of the exact nature of accidents, not from heart disease, as previously surmised, has come to be perfectly safe, as simple apnœa of chloroform (cardiac syncope of snow) is due to diminished action of the respiratory muscles and general reflex system, so readily excited by electricity when ordinary means (which is not often) fail to restore the patient.

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41. *Apnœa Neonatorum.*—Dr. GEORGE GREAVES, in a paper in the *British Med. Journal* (July 5th and 12th, 1862), endeavours to reduce into a consistent theory the facts relating to the condition of the vital functions of the fœtus during labour, and of the new-born child in the interval which occurs between birth and the full establishment of respiration. This question has not, he contends, received the attention it deserves. The subject is commenced by a reference to the state of infants apparently stillborn. Of these there are three classes: 1. The surface of the child is pale, the body is motionless, the pulsation of the funis has entirely ceased, the beating of the heart can scarcely be felt; this is syncope. 2 The external phenomena are the same, but there is still some pulsation in the cord, though it is weak and slow; this is apnœa. 3. The pulsation of the cord is not necessarily slow, may be strong, the surface is rather blue than pale; the face and neck are livid and swollen; the eyes are often widely open. This is a partially apoplectic or comatose condition. The two first classes of cases are the same in kind, only differing in degree, and they depend on one cause, namely, the more or less prolonged interruption to intercommunion between the organisms of the mother and the fœtus; but in the third class of cases the condition is essentially different, there have been incomplete attempts at respiration, and the phenomena of congestive apoplexy are present. The consequences produced by interruption to the placental action on the fœtus are two, the fœtus is deprived of food and also of air. The effects of the deprivation of the latter only it is necessary to consider. This suspension of the breathing function of the placenta may be effected: 1. By the blood of the mother not being sufficiently arterialized. 2. By great loss of blood or other cause producing syncope in mother, whereby the quantity of blood sent

to the placenta is materially diminished. 3. By interruption to the circulation through the umbilical cord. This most frequently occurs during labour; but it may occur prior to this and from other causes: knotting of the cord, or knotting round a limb, or round the neck; extensive œdema of the cord; twisting of the cord on itself; these causes also may produce the effect alluded to. 4. There is a class of cases in which there is interruption to the breathing function of the placenta owing to contractions of the uterus during labour. This is intermittent in its action, and does not usually go beyond a lowering of the vital activity, and a weakening and retardation of the pulse of the fœtus while the cause is in operation. This class of cases the author wishes to direct special attention to. He states that it has been found by many observers that there is during labour a retardation of the fœtal pulse, and he substantiates this by reference to the works of Hamilton, Kennedy, Moir, and Sidey. The diminution of the frequency of the fœtal pulse during the pains of labour, to the extent of a third or even of one half, may, he presumes, be accepted as an ascertained fact. What is the cause of this retardation? "It will be at once admitted that it is a cause which, operating with more than ordinary force, must be the chief agent in producing still-birth." It has been the custom to ascribe the still-birth, when not manifestly dependent on immaturity or disease of the fœtus, to pressure of the uterus on the fœtus. It has been assumed that this pressure is exercised on the chest or head: it is difficult to conceive, however, how this can be the case. Compression of the placenta between the body of the child and the placenta has also been set down as a cause. This may be the case, but only as subsidiary to one which is, the author believes, the main agent in producing the effect in question, viz., the obstruction by the contraction of the uterine fibres of the flow of blood through the ultimate ramifications of the uterine blood-vessels, the "curling arteries." The temporary stoppage of the circulation in the vessels here alluded to has not been spoken of by any previous writer. The blood in the fœtal vessels cannot be duly aerated if the blood sent to the placenta be greatly diminished, and as a consequence of this it stagnates. The fœtal heart beats more and more weakly, and less frequently, and finally ceases unless the obstruction to the placental circulation be removed. The heart of the fœtus ceases to act from over-distension. In the early stage of labour the pains occur with long intervals, there is consequently ample time for the placenta to recover itself; if the labour be very rapid, and intervals of rest be not afforded, the child is born apparently or really inanimate. In a more advanced stage of labour, when the liquor amnii is discharged another cause comes into operation, the placenta becomes actually partly detached, and the connection between the placenta and the uterine arteries is in places permanently broken; in cases of placenta prævia this event occurs at the commencement of labour and in a large proportion of such cases the child is stillborn. The cause now pointed out by the author is in operation in every labour. To the possible objection to the position here taken up, that the circulation in the cord cannot be suspended, inasmuch as the cord still continues to pulsate, the author answers that pulsation is not necessarily a sign of the passage of blood; the cord pulsates after it has been tied between the ligature and the heart. Compression of the placenta generally, may intensify the action here alluded to, but in a secondary manner. After labour has begun, the funis may be compressed and extended from well known causes. The action of the uterus may be thereby intensified, and the uterine arteries more and more compressed as above described. Compression of the head has possibly its share in producing still-birth in tedious labour from contracted pelvis, but this cannot be the case in still-birth with unusually rapid labour. A further effect of stoppage of placental circulation is that the entry of blood from the placenta to the fœtus is prevented, and what arrives is impure and devoid of vitalizing properties. When the apoplectic form of still-birth is present, the phenomena are different; the pulmonary organs have been partially expanded, the pressure on the column of blood in the ductus arteriosus has been relieved to a certain extent, while the foramen ovale has become partially closed. On this respiration process being interrupted, however, the right heart becomes congested, hence the lividity, swollen features, &c. The alleged effects of secale cornutum are explained by

what has been here related of the effects of rapid labour. It is fatal to the child when it gives rise to permanent unresting uterine contractions, unless we admit, at least, the directly poisonous influence of the drug on the fœtus.

The practical conclusions drawn are: It is perfectly useless to delay tying the cord after the expulsion of the child; more, it is injurious by interfering with efforts at resuscitation. In attempts to resuscitate a still-born child, the first thing which should be done is to allow of the escape of a minute quantity of blood from the cord, thus to relieve that distension of the heart which prevents its action. If after a pause of two or three minutes the child does not breathe, and is not really and manifestly asthenic from prematurity, disease, &c., the cord should be divided, and one to three drachms of blood allowed to escape. In apoplectic cases the quantity removed may be greater. The next step is to induce respiration. The warm bath is, the author believes, injurious; dashing cold water on the chest, slapping the back or nates with the hand, circular friction on the epigastrium with the tips of the fingers are all useful. These rarely fail if the heart still beats. The direct inflation of the chest with air is preferred to the "ready method" should the above measures fail.—*Sydenham Society's Year Book* for 1862.

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42. *Simultaneous Uterine and Extra-Uterine Gestation Proceeding to the full Term of Gestation.*—Mr. L. R. COOKE read before the Obstetrical Society of London, June 3, 1863) the following account of a case of this.

E. R——, aged thirty-nine years, who had had three previous natural deliveries, was taken in labour on December 8th, 1862. She had suffered no very unusual amount of inconvenience during her pregnancy beyond dragging pains, and an unusual sense of weight in the abdomen. On external examination, the abdominal swelling was found to differ from its normal characteristics, in having its greatest prominence considerably to the left side, and about on a level with the umbilicus; the whole tumour being also more circumscribed, well defined, and spherical in form than usual. The limbs of a fœtus were distinctly traceable through the abdominal walls, and a placental souffle was audible over a large portion of the tumour. A vaginal examination showed the canal much elongated, its rugæ obliterated, and the os uteri drawn up beyond reach of the fingers. Suspecting therefore an abnormal gestation, Mr. Cooke requested Mr. Spencer Wells to see the patient with him, and he attended with Dr. Kuman, of Vienna. It was thought there were two sets of fœtal heart sounds, while the extensive surface over which the placental bruit was heard gave a suspicion of two placentæ. Whether the fœtuses were both intra-uterine, or an ovarian tumour present also, was uncertain. At this time the pains were so slight and at such long intervals, that the patient was left, the bladder having been emptied, and a grain of opium administered, instructions being given to send for Mr. Cooke on the occurrence of expulsive pains or of any change in the patient.

She passed a good night, and the uterine pains had been gradually re-established during the next day. At six o'clock P. M. Mr. Cooke was sent for, and found her in strong labour. Making an immediate examination, the sacral concavity was now found occupied by a firm, resisting, rounded tumour, presenting no trace of fluctuation, and immovable under a very considerable degree of force employed between the pains. Its presence reduced the outer posterior dimension of the inlet to less than two fingers' breadth, through which no os uteri was discoverable; but resting on and anterior to the symphysis pubis, a small portion of the convex cranial surface of a fœtus was to be felt.

Dr. Greenhalgh and Mr. Meates, of Chester-square, saw the patient. The diagnosis was still a matter of doubt, because the tumour was not traceable abdominally, the uterus being in front more or less; and examined per vaginam, it might equally have been taken for a solid tumour or a pedunculated fibrous outgrowth from the uterus.

The obvious indication was to deliver the woman as speedily as possible, as the severity and frequency of the pain threatened rapid exhaustion of her strength, if not rupture of the uterus. Perforation of the head of the fœtus was considered inadmissible from the almost impossibility of getting at it and

fixing it, and because also, even supposing it accomplished, evisceration and dismemberment under the same difficulties would have been equally necessary.

It was decided therefore to put the patient under chloroform, so as to suspend the action of the abdominal muscles, in order to endeavour to displace the tumour and turn the child; and failing that, to perform Cæsarean section. This being done, the tumour was pushed out of the vagina with some difficulty, and delivery completed by version. The placenta being removed, and the uterus not contracting satisfactorily, the woman moreover being much exhausted, it was thought advisable to avoid any manipulation of the abdomen with a view to discover the nature of the remaining tumour. She never entirely rallied from the shock and exhaustion from the operation, and died within forty-eight hours.

The autopsy was made four hours after death, Dr. Greenhalgh, Dr. Kuman, Mr. Spencer Wells, Mr. Meates, Mr. Colborne, and Mr. R. L. Cooke being present. On opening the abdomen and reflecting the walls, the first thing revealed was the body of a full-grown female fœtus contained in its proper membranes, which was unruptured, and distended with liquor amnii. The anterior or external surface of the chorion was perfectly smooth, and in immediate relation with the abdominal peritoneum. Beneath the tumour the uterus was seen, partially contracted and unruptured. There was a large quantity of greenish-brown, grumous fluid in the peritoneal cavity. On opening the fœtal membranes and removing the fœtus, it was found that the placenta was situated in, and firmly attached to, a shallow capsule, formed of the expanded and enlarged fimbriæ of the right Fallopian tube, which on its convex or peritoneal aspect was firmly tied down by numerous and very tough bands of old adhesion. A stylet could be passed along the tube to its expanded extremity, when it became arrested by the placenta.

The author remarked, that the lessons derivable from this case appear to be mainly—

1. That in cases of doubtful tumours complicating parturition, it may be well to discover, as far as may be, whether there is any evidence of an extra-uterine fœtation as soon as possible after uterine delivery.

2. Whether, in case of such a discovery, the probability is or is not that the adhesions of the tumours may be so firm and numerous as to render gastrotomy inadmissible.

3. Whether, supposing the existence of such adhesions to be admitted, it is advisable or justifiable to remove the fœtus alone with the certainty of a portion of the liquor amnii escaping into the peritoneal cavity, and with the possibility of the placenta becoming encysted and being thrown off at a future period.

Dr. Greenhalgh remarked that the case so ably narrated by Mr. Cooke was most interesting in a diagnostic and practical point of view, and he believed was without parallel in the annals of obstetric medicine. He drew attention to the remarkable absence of abnormal symptoms during pregnancy, to the extreme anteversion of the womb, and to the influence of the labour pains in forcing the extra-uterine fœtus from its position in the abdomen into the pelvis, and so occasioning an obstacle to the passage of the intra-uterine fœtus.—*Lancet*, July 11, 1863.

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43. *Extra-Uterine Pregnancy—Delivery per Anum.*—Dr. Matthews Duncan exhibited to the Medico-Chirurgical Society of Edinburgh a fœtus apparently nearly fully developed, but in an advanced stage of a peculiar decomposition, which he had delivered per anum as a breach presentation. He was indebted to Dr. Sanders for this interesting case, the woman having been transferred to his care by Dr. Sanders, under whom she was originally placed in the Royal Infirmary. The case was, in every respect, one of very great clinical interest. Dr. D. would here only observe, that although the operation appeared very formidable, and the woman appeared to be in a state of very great exhaustion and danger, yet two days after the removal of the child she wished to be allowed to leave her bed and go to the fireside, and had made a rapid recovery without a bad symptom. After the birth of the child, Dr. D. passed his hand and arm per anum into the cyst, to examine it and remove its contents. In two

days after this great distension of the anus, it had so far recovered its function, that the woman, though affected with diarrhœa, no longer soiled her bed, and after other four days the sphincter acted quite as efficiently as before the operation, gently grasping the finger passed through it.—*Edinb. Med. Journ.*, July, 1863.

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## MEDICAL JURISPRUDENCE AND TOXICOLOGY.

44. *Poisoning by Phosphorus.*—In the Clinical Report of the Hospital of Hamburg, for 1861, by Dr C. TÜNGEE, there is a history of nineteen cases of phosphorus poisoning. In all these cases the poison was taken intentionally, for the purpose of suicide, by persons who were suffering from mental distress.

Amongst the symptoms observed in these cases, the reporter remarks that there were presented few of those usually ascribed to the effects of phosphorus. The appearances of gastro-enteritis which are commonly assumed to follow large doses were not offered, nor was there shown any indication of those signs of nervous excitement which are assumed to follow upon the administration of small doses of the poison. The first symptoms occurred a few hours after the administration, and were usually excited by the absorption of foods taken into the stomach, especially fluid foods, such as milk. The first symptoms were vomiting, pain in the stomach, and burning, but the indications of the irritation of the mucous membrane of the stomach were rarely intense, and there was seldom any action of the bowels, but more frequently constipation. In several cases, during slow recovery, jaundice was presented, which in a few days also passed away. Together with the external sign of the jaundice, there were indications of fulness in the stomach, deficient appetite, faintness, and vomiting of bile, and in severe cases præcordial pain, giddiness, noises in the ears, throbbings in the head, sleeplessness, black vomit, and evacuations from the bowels containing blood. The pulse and the animal temperature showed very little deviation. The voice, in nearly every case, was low, but this sign the writer properly considers was rather attributable to the mental condition of the sufferer than to the physical. In some instances, the patients gave evidence of delirium and coma; in others, where the cases ended fatally, there was consciousness up to the period of death. In the latter examples, the præcordial pain was most marked, and there were signs of cerebral anæmia. The action of the kidneys was irregular and difficult, the urine was acid, and rarely albuminous.

It was impossible to determine the quantity of phosphorus taken in every case, but one man took from two to three grains in an electuary, and another half a scruple in honey. The active effects of the poison seem to have been greatly increased when it was swallowed in fluids, especially in warm water and milk.

Of the nineteen cases of poisoning fourteen recovered; in the five that died, the following were the leading morbid presentations. The general fact was that the morbid signs were those of jaundice in an intense form; the liver was increased in size, free from blood, and indicated marked fatty change. The kidneys were degenerated, and their epithelial structure was destroyed; ecchymoses were observed, and the blood was fluid, as in icterus and in yellow fever; there was also molecular destruction of the muscular fibres of the heart.

In regard to treatment, emetics were found to be the most useful antidotes; and the fear of exciting gastro-enteritis, either by the use of emetics or purgatives, proved groundless. After free emesis, a purgative was valuable, but castor oil, and all oils had to be avoided, owing to the solubility of the phosphorus in them. Dr. Tüngel believes from his observations, that phosphorus does not readily oxidize in the stomach, and in none of his cases was there any indication of recent inflammation of the lining membrane. In the first stages of poisoning, calcined magnesia was useful. The paper noticed is most valuable. Its teachings extend beyond the simple question of poisoning by felonious or suicidal intent, into various questions connected with general pathology and natural disease.—*B. and F. Med.-Chir. Rev.*, April, 1863.

# AMERICAN INTELLIGENCE.

## ORIGINAL COMMUNICATIONS.

*Case of the Intussusception of the Small Intestine; thirteen inches of the ileum separated and discharged; recovery.* By A. S. Bare, M. D. Communicated by Jno. L. Atlee, M. D., in a letter to the Editor.

Dear Sir: The report of the following remarkable case was handed to me by my friend and former pupil, A. S. Bare, M. D., of this county, which, if you deem worthy of publication, you will please give a place in the Journal.

It is one of those cases where death is almost uniformly the result; and where, most probably, the event is hastened by injudicious efforts to remove the obstruction. In this case, I have but little doubt that the successful issue is attributable to the early and correct diagnosis of Dr. Bare, and to the very judicious treatment adopted by him from the commencement. The portion of intestine discharged is now in my possession.

I am, dear sir, very respectfully yours, Jno. L. Atlee.

Lancaster, Pa. Aug. 1, 1863.

"I was called to see Mrs. John Parmer, aged 58, on the 5th Oct. 1862, at 2 o'clock P. M. I found her labouring under the most excruciating pain, immediately below and to the right of the umbilicus. Her skin was cold and clammy, pulse thready, and 122 to the minute; tongue dry and thirst incessant. At 10 o'clock on the morning of that day, the patient had climbed a fence to gather peaches from a tree. She jumped from the fence, and, to use her own expression, felt something give way in the abdomen, causing severe pain, which continued to get worse, when I was sent for, and found her as above described. From the history of the case and the symptoms present, I believed it to be a case of intussusception of the ileum, and at once resolved, if possible, to adopt such means as in my judgment would save my patient. Believing that the obstruction existed, I studiously avoided all medicines that would increase the peristaltic motion of the intestines; gave largely of opium and morphia, and, occasionally, blue mass. By injection, I administered demulcents with laudanum. On the third day, a more stimulating injection was administered; the abdomen became distended, and a large blister was applied over it. By means of the injection, the lower bowels were evacuated. Continued the opium and blue mass. From this time to the 11th, the treatment was the same. On the 10th, air passed through the intestines, which was considerable in quantity on the 11th. I now ordered a little castor oil with laudanum, and on the 12th the bowels were opened. On the 13th, 14th, and 15th there was excessive diarrhœa, which was finally overcome by the use of acetate of lead and opium. On the 16th and 17th, supported the patient with injections of chicken broth. On the 18th a portion of intestine, about thirteen inches long, was discharged. From this time the patient gradually recovered, and now only suffers from indigestible food, when it passes the stricture."

April 7, 1863.

*Gunshot Fracture of the Right Orbit, and Lodgment of a Minie Ball in the Head of the Humerus.* By PHILIP S. WALES, M. D., Surgeon U. S. N. —C. D., sailor, aged 18, was admitted to the hospital at Portsmouth, Va., October 5th, 1862, with a gunshot fracture of the base of the orbit and a gunshot wound of the shoulder. In an engagement with the enemy, this man was struck by two Minie balls at the same time; one impinged against the external angular process of the frontal bone, comminuting this, opening the ocular globe, passed backwards obliquely through the temporal fossa and muscle, and escaped about midway between the right ear and the eye: the other entered the right shoulder about the middle of the deltoid, and there remained. When brought into the house he was semi-comatose, the left eye was swollen and ecchymotic, and a small wound was observed upon the cheek below it, which was probably produced by falling against some projecting body after being shot. The eyelids of the right side were swollen. A bloody puriform matter escaped from his nostrils. Pulse 84; respirations 16. Was ordered: R.—Hyd. chlor. mit., Pulv. Jalapæ, āā gr. x. Ft. in pulv. j. Injection of a turpentine enema in the evening.

*October* 6. Patient in same state; breathes deeply, like one in a profound sleep, but could be aroused sufficiently to put out his tongue and give monosyllabic replies. Less swelling in the side of the face; is thirsty, and asks for water. The medicine purged him freely last night. Took a little gruel this morning. R.—Tr. aconite, gtt. v, every third hour. Continue cold water dressings to wounds.

8*th*. Palpebræ of the right eye ecchymotic; is asleep most of the time; pulse 84. With the probe a roughened surface could be felt in the wound of the shoulder. Same dressings.

10*th*. Wounds beginning to suppurate; dressed them with oakum; nasal discharge continues; pulse 97.

13*th*. Removed several small spiculæ of bone from the temporal wound. Continue dressings of oakum.

15*th*. Is improving a little, but still symptoms of cerebral inflammation. R.—Pil. hyd. gr. j; Pulv. rhei, Sodæ bicarb., āā gr. ij. Ft. in pil. No. ij, every third hour.

19*th*. Gum slightly touched; omit medicine. Is delirious this morning. Apply cold to head. Midnight. Comatose; cannot be roused by the loudest calls and most rigorous shaking. R.—Ol. tiglii, gtt. ij; Micæ panis, q. s. Ft. in pil. j.

20*th*. Had convulsions last night three times, each paroxysm lasting some minutes. Continue cold.

27*th*. Is sensible this morning; can converse easily; complains of much pain in wound of temple, where an abscess has formed; punctured it, with relief of the pain. The ocular membranes are much swollen upon this side, and project forwards, bulging the lids outwards as well as everting them. Continue dressing wounds with oakum.

*November* 8. Has been gradually improving; the head symptoms have completely disappeared. Sat up an hour.

21*st*. Sits up all day; nutritious diet.

27*th*. Punctured a small abscess upon the shoulder. There is evident paralysis of the deltoid muscle.

*December* 10*th*. The patient has daily improved in health and strength. The arm hangs powerless beside him. An exploration of the wound in the shoulder soon convinced me that there was a foreign body impacted into the bone. A long incision was made perpendicularly to the fibres of the del-

toid down to the head of the humerus, and, after a good deal of difficulty, I seized and removed a Minie ball deeply lodged into its cancellous structure, about a quarter of an inch below the anatomical neck. The apex projected outwards just above the level of the bone, and its conical shape, besides being imbedded in the osseous tissue, offered the greatest obstacle to its removal, for the instrument slipped every time any tractile force was used, until finally I managed to slip the two branches of the forceps between the ball and bone, and then with all the force I was capable of using with it as a lever, I extracted the mass of lead safely.

*January* 10. The wounds have completely healed on the shoulder, and the function of the arm perfectly restored.

To-day a part of the orbital process of the frontal bone, adjoining the external angular process, was found necrosed and causing considerable local irritation, with profuse discharge of pus from the wound on the eye.

By an incision through the outer canthus to a point an inch beyond it upon the temple, and subsequently dissecting up the superior flap a sufficient distance, I was enabled to seize the dead bone, and remove it safely. Its size was that of a ten cent piece, rounded, and concavo-convex.

30*th*. The man is now convalescent, and by the judicious use of compression, I have succeeded in remedying the eversion of the palpebral conjunctiva, and the eye will soon be in a condition for the use of an artificial one.

This case presents some interesting features in a diagnostic point of view; there were injuries of both eyes, and when the patient was sent to the hospital it was thought that there was also a gunshot wound and fracture upon the left side like that upon the right; but the distinguishing phenomena were, that, in the former case, the swelling was considerable, and the ecchymosis came on immediately, and was seated in the substance of the lids, and more superficial; while the ecchymosis in the latter case came on later, and extended gradually from the outer canthus inwards under both eyelids and conjunctiva, and there was no great amount of swelling.

From these features alone it might have been safely diagnosed "fracture of orbital plate upon right side, simple contusion upon the left." And in recollecting the anatomical fact that the palpebral ligaments pass from the orbital margin to the edge of the tarsal cartilages, thus cutting off communication between the subcutaneous and submucous cellular tissues, we can easily understand why a blow around or below the eye, as in this case, causes an effusion of blood into the loose connective tissue, taking place rapidly and largely, is confined to the thickness of the eyelids. On the contrary, a fracture of the orbital vault must communicate with the cellular tissue of the eyeball and that beneath the conjunctiva, and thus get in between the palpebræ and their mucous lining, or between the globe and its mucous membrane.

However, in this case, the diagnosis of fracture upon the right side was unavoidable by the cerebral symptoms at first, and subsequently finding loose bone with the probe in the orbits.

As to the treatment, I think that the presence of so large a piece of necrosed bone in proximity with the brain would have caused grave cerebral complications, and its removal was imperatively demanded. Baudens relates a case in which, after a gunshot fracture of the external angular process, a quantity of loose fragments adjusted in their places, and finally consolidated. Desmarres mentions another where he preferred to permit a fistula to form over the lower orbitary margin and to discharge copiously for two years, than to remove the osseous spicula upon which it depended, regarding the operation difficult and dangerous.

The prognosis of my case was unfavourable, the wound being oblique and implicating only one temple. Heister remarked that most of those wounded in one temple, at a certain battle, died immediately or shortly after. On the contrary, Thompson saw, after the battle of Waterloo, ten cases where the ball passed from temple to temple transversely, yet all recovered. Did the vulnerant body pass through the cerebral lobes, as some maintain, to account for the symptoms?

Then a direct wound of the eye is most always fatal, passing back, as it does, implicating the brain; an oblique one less so; and a transverse one least of all.

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## DOMESTIC SUMMARY.

*Bromine in Hospital Gangrene.*—Dr. M. GOLDSMITH, Surgeon U. S. V., gives (*American Med. Times*, Sept. 12, 1863) the following consolidated statement of the cases of hospital gangrene, of which he has gathered the records from various U. S. military hospitals. Four of these cases terminated fatally. "One of these cases," he states, "is reported as having been brought into the hospital moribund. Two were cases in which the disease attacked the track of ball wounds passing through the thigh, and in which the bromine was applied to the external parts, the apertures of entrance and exit only, and therefore did not touch the major part of the gangrenous surfaces. One, in which, with a wound like those just mentioned, the cellular tissue of the limb from the trochanter major to the malleoli was destroyed by cellulitis. It will also be noticed, that in four cases the bromine is reported to have failed in arresting the gangrene. In each of these the bromine had been applied, I have reason to believe, much more frequently than is compatible with the establishment of granulation—for bromine is a caustic agent. In one case granulation occurred two days after the abandonment of the bromine, and the use of a weak solution of creasote; in two cases after the use of a solution of the persulphate of iron, and in one case after the use of a cow-dung poultice.

*Consolidated Statement of Cases of Hospital Gangrene treated in Louisville, Nashville, Murfreesborough, and New Albany.*

| | Whole number. | Recovered. | Died. | Amputations. | Average duration of treatment. | | Percentage of deaths. |
|---|---|---|---|---|---|---|---|
| | | | | | Days. | Hours. | |
| Treated with bromine in any way . . . . | 152 | 148 | 4 | 0 | 5 | 14 | |
| Treated with bromine pure exclusively . . | 27 | 25 | 2 | 0 | 2 | 22½ | |
| Treated with bromine in solution exclusively . | 86 | 84 | 2 | 0 | 6 | 11⅓ | 2 65-100 |
| Treated with bromine pure after the solution failed | 8 | 8 | 0 | 0 | 12 | 18 | |
| Treated with bromine after nitric acid failed . | 23 | 22 | 0 | 1 | 3 | 16⅓ | |
| Treated with bromine after other remedies failed | 8 | 8 | 0 | 0 | 3 | 4 | |
| Treated with nitric acid exclusively . . . . | 13 | 5 | 8 | 0 | 3 | 14 2-5 | 69 54-100 } 50 |
| Treated with other remedies exclusively . . | 13 | 7 | 5 | 1 | 7 | 13 5-7 | 38 47-100 } |
| Treated with other remedies after bromine had failed . . . . . . . . . . | 4 | 4 | 0 | 0 | | | |

"I beg here to call the attention of such of your readers as may be interested in the matter to the fact, that almost all the surgeons who have adopted the bromine treatment of hospital gangrene rely now upon the use of the pure undiluted agent, the various solutions having been found less prompt in their effects, and, for the ends in view, less reliable."

Dr. POST, in a discussion before the New York Academy of Medicine (May

20th, 1863), made the following remarks on the use of bromine in hospital gangrene, as reported in *American Med. Times*, Sept. 12. "The local treatment seemed to have played the most important part in arresting the progress of the disease. The remedy used more than any other was one introduced by Dr. Middleton Goldsmith, Assistant Med. Director. I refer to bromine, or some of its preparations. It is principally with reference to the action of bromine as a local application that I have risen to speak. The preparations of bromine that have been used have been either the pure bromine, a dark red liquid with a pungent odor, or more frequently a preparation analogous to Lugol's solution of iodine—160 grains of the bromide of potassium are dissolved in 4 oz. of water, this solution is placed in a bottle, and an ounce of bromine is added, making a solution of the bromuretted bromide of potassium. In some cases there is a simple residuum, owing doubtless to some existing impurity in one or other of the ingredients. It is a reddish-coloured fluid, from which the fumes of bromine are given off. The mode of making the application has varied somewhat with different surgeons of the hospitals I have visited, but those who used it with the most care and success used it in the manner which I will indicate. In the first place, after the sloughing process has been fully established, when the tissues involved have become positively putrid, and there is a disposition to form a separation between sound and healthy parts, all the dead portions are carefully detached by means of a scissors, after which the denuded part is thoroughly washed with a syringe and lukewarm water; after this the comp. sol. of bromine is brought in contact with every portion of the sore either by means of a camel's hair brush or a small syringe. If there be sinuses, the fluid is injected into them, and the same thing is done with the undermined integument. In case of a gunshot wound through the limb, when the syringe cannot easily be used, a small strip of old linen is attached to the eye of a probe after having been dipped in the solution, and drawn through the wound. This linen is then left in until the next day's dressing.

"The first effect of the bromine was very remarkable in removing all offensive odour—the fetor would be removed in a very remarkable manner, so much so that you had to apply your nose close to the surface of the sore to detect any odour whatever. The next effect was to coagulate the albumen and leave the part as if varnished—there was no appearance of putrefaction whatever. The patients complained of severe pain at the time of the application, but I have reason to believe that such complaints were much exaggerated. The dressing applied after the application of the bromine varied in different cases. In most cases the surgeons were in the habit of applying yeast poultices, and they also used, as a substitute for this, a fermenting substance made by adding carbonate of soda and tartaric acid to a poultice. I suggested to them the propriety of substituting the bicarb. potash for the cream of tartar, on the ground that the gas would in that event be more slowly evolved. In other cases the liq. sod. chlorinata was used; in fact, numerous applications of the sort were made according to the peculiar notion of the surgeon-in-charge.

"I found that there were some of the surgeons in Nashville who were sceptical with regard to the advantages of bromine as a local application, they maintaining that they had better success from the use of nitric acid; but I observed that some of these gentlemen had applied it in rather a careless way, while they had used the nitric acid more thoroughly and with more care. There was one gentleman, particularly, who seemed very sceptical. I informed him, that he had not applied it as carefully and as thoroughly as the other surgeons, and therefore he erred in a good effect. I also suggested, that if he would use it in another way he would have like success. Since I have returned to the city I have received a letter from that gentleman, and he tells me that he has taken my advice with reference to its mode of application, and has been abundantly successful.

"With regard to the constitutional treatment, I believe there can be very little discrepancy of opinion concerning the use of tonics, stimulants, and good food in this disease.

"I will observe, that those gentlemen who have used bromine so largely look upon it as an antidote to the poison, whatever it is, of hospital gangrene, and

consequently they do not advocate the free circulation of fresh air as they otherwise would.

"I observed that bromine was used for disinfecting the atmosphere of the ward, by pouring it into saucers, or by carrying an open-mouthed bottle containing the liquor through the ward. This was done five minutes at a time three times a day, and the fact that the gangrene did not spread where bromine was used, seems strong proof of the existence of the property claimed for it.

The frequency of its application varied with different surgeons from once to twice or three times in twenty-four hours. When the surface of the granulations became visible, the solution was weakened. In the cases that I had the opportunity of seeing, the disease was arrested throughout the great body of the sore within two or three days. In the case of the seton in the back, the disease was not arrested ten days after the application, but I have afterwards understood from Dr. Goldsmith that the disease was finally entirely checked.

"I have come to the conclusion, from what I have seen, that the application in the treatment of hospital gangrene is very highly conducive to the welfare of the patient, and I think that it will prevent the spread of the disease.

"There is one important fact connected with bromine which I think well worth relating. I saw, at Louisville, a case of hospital gangrene of the leg, where, in the course of the disease, the posterior tibial artery became involved, and hemorrhage occurred. The interesting feature in this case was, that the surgeon-in-charge tied the artery at the bottom of the sloughing surface, and applied the bromine immediately over it. I saw that case a little less than a week after the application occurred, and the case was doing remarkably well. The ligature had separated the day before I saw it, and at that time the sore was in a state of healthy granulation. I am unable to say whether any further hemorrhage occurred. Dr. Goldsmith informed me, that the case was the fourth one where such a result was obtained from the application of bromine. This is a very remarkable fact, because the general result of tying arteries in the midst of sloughing parts is that hemorrhage takes place very soon again. If bromine has the power of arresting this sloughing process, it is a fact well worthy of our investigation.

"Dr. POST, in conclusion, alluded to the good effects claimed by the surgeons for bromine in cases of diphtheria and erysipelas. In the 'Park Barracks,' in Louisville, erysipelas broke out with great severity, and the moment that the bromine treatment was introduced the disease ceased to spread. The remedy was used both in fumigation and as a local application. The surgeons were in the habit of moistening lint with the compound solution of bromine, and applying it directly to the part, and covering the whole with oiled-silk. Dr. Post saw a number of cases treated in that way, where improvement had taken place in a very short time. He was informed by those gentlemen who had charge of the erysipelatous hospital, that in almost all cases, in from twelve to twenty-four hours after the commencement of the treatment, the erysipelas began to subside. It scarcely, in any case, continued to spread beyond two or three days; generally its spread was checked within from twelve to twenty-four hours."

Dr. WILLIAM B. ALLEY reports (*Buffalo Med. Jl.*, Sept. 1863) a severe case of hospital gangrene successfully treated by bromine.

Dr. R. S. STANFORD, Surgeon U. S. V., also reports (*American Med. Times*, July 18, 1863) a case of hospital gangrene successfully treated in Hospital No. 12, Louisville, Ky., by the same article, and expresses great confidence in its efficacy.

"From my own observation," he says, "in the treatment of hospital gangrene, erysipelas, and diphtheria, I am entirely satisfied that all of them are local diseases, and may be cured by the use of bromine properly applied. The foregoing case establishes, as far as any single case can do, the efficacy of pure bromine over the compound solution, the latter having been applied daily for the term of twenty-seven days without arresting the gangrenous process, while the pure bromine arrested it upon the first application. The wound was prepared for the reception of the remedy in the same way, and with no more pains

than had been taken upon each application of the solution. The constitutional symptoms subsided within twenty-four hours after the pure bromine had been applied; the gangrenous odour disappeared entirely within the first six hours after the application of the pure remedy. Within twenty-four hours the appetite returned, and has continued good ever since. The skin gradually gave up its dirty yellowish hue; the urine also gradually returned to the normal colour; the pulse dropped down to eighty, and has maintained that number of beats per minute from the second day after the application of the pure remedy up to the present time.

"The patient is now able to walk about the ward, and would do so if he had two legs. The wound has been filled with granulations, and is being skinned over, there only remaining a small portion upon which the skin has not been renewed, and this immediately around the bone.

"If this was the only case I had treated with this remarkable agent, I could not speak in as strong terms as I am now about to do; but I have treated a number of cases that were equally as grave as this one, and with complete success in every instance; and numerous cases in other hospitals have been met, where a like success crowned its proper application. I can say to the profession with unbounded confidence, that we have in bromine an agent that will, when properly applied to gangrenous ulcerations, cure them in every instance with more certainty than quinine cures intermittent fever."

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*Veratrum Viride as a Means of Diagnosis in Diseases of the Chest.*—Professor Samuel R. Percy, M.D., extols (*American Med. Times*, July 11, 1863) the value of the veratrum viride as a means of diagnosis in diseases of the chest.

He states that since 1856 he has "been in the habit of preparing every patient, whose heart or lungs I have wished to examine, with small and proper doses of veratrum viride, and by this means I have been enabled to arrive at a clear and certain diagnosis of cases of incipient phthisis, pleuritis, pneumonia, diseases of the heart, etc., that I could not clearly diagnose without the previous preparation of the patient with this remedy, owing to functional disturbances or other exciting causes. There are many persons who are examined for these diseases where it is almost impossible to arrive at any correct diagnosis in the early stages of disease, at which time *only* treatment can be expected to be of much avail, owing to even slight functional disturbances, which completely mask or render obscure the signs that without the disturbing causes would be readily recognized. Now veratrum viride quiets these functional disturbances, lessens the rapidity of the circulation, tranquillizes the respiration, and thus so moderates these functions that the mind can readily define and arrange the sounds that are communicated to the ear. I give you this new means of diagnosis as the results of my own investigations. I am not aware that it has ever been practised, except by those to whom I have communicated it. I need not impress upon you its vast importance, for by means of this practice you may always know what you are treating, and you will find that that is no slight gain in your ability to inform your patient of what he may expect from your treatment. This new means of diagnosis will be of inestimable value to the Life Insurance Companies in all cases of doubtful diseases of the chest."

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*Extirpation of Parotid Gland.*—Prof. D. Brainard reports (*Chicago Med. Journ.*, Aug. 1863) the following example of this:—

"Timothy Brodley, of Fond du Lac, Wisconsin, aged 45, healthy, of good constitution, perceived when he was 21 years of age, a tumour below the body of the lower jaw. This grew to the size of his 'fist' without pain, and was removed in 1850 in Ireland.

"About 1858 he perceived it returning in a small tumour behind the ramus of the jaw on the right side. It grew without pain until Jan. 1863, when it presented the appearance shown in the photographic figure. It then extended up to the zygomatic arch, and down to the middle of the neck, forward upon the side of the face, and backwards under the sterno-mastoid muscle, was detached, very movable, but the skin was adherent to the surface.

"Wednesday, Jan. 14th, 1863, I removed it in presence of the Medical Class of Rush Medical College, assisted by Prof. J. W. Freer.

"Two incisions were made to embrace the adherent portion of the skin, which was then dissected up before and behind. I then commenced separating it from below upwards with the finger. This was readily done till the back and upper part was reached where it involved the external carotid and jugular vein, which were tied below and then divided. The dissection was then completed mostly with a blunt instrument. The upper end of the external carotid artery required ligature, and one branch below. The tumour in its growth had drawn the parotid gland out of its place so that it was not difficult to pass an instrument behind its upper part.

"When the tumour was removed, there was a space extending from the articulation of the lower jaw below the corner of the os-hyoides. The styloid process, stylo-hyoid ligament, the internal jugular vein and internal cerebral artery were exposed, and the space behind and within the ramus of the jaw was cleared.

"Prof. Freer, for many years Prof. of Anatomy in the College, examined carefully and could find no trace of the parotid gland. The right side of the face was paralyzed.

"On examination of the tumour, pieces of the gland in a healthy state were found around the upper edge; below this a considerable part seemed composed of the same tissue altered in structure which was softened and redder than natural. At the lower part there was a softer granulated mass, which Dr. Freer examined with the microscope. He found no common cells, but rounded granules with traces of ducts.

"Without assuming to decide positively as to the tissue in which this disease originated, it is certain that it involved the whole of the parotid gland except slight particles above.

"To the naked eye the structure of it appeared to be the fibro-plastic material. No doubt can, I think, exist as to the removal of the entire gland, which I have removed in two other instances, and the reports of which cases have been heretofore published in this journal.

"The time required to complete the operation was perhaps thirty minutes. The hemorrhage was considerable, but by tying the external carotid before dividing it, this was partly controlled. No accident happened to the patient, and in twenty days he returned home with the wound nearly healed."

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*Remarkable Instance of the Glancing of a Minie Ball.*—Dr. GEO. F. FRENCH, Act. Ass. Surg. U. S. A., relates (*American Med. Times*, April 4, 1863) the following example of this: "Geo. Fowler, Co. F, 50th N. Y., was admitted into hospital, December 19th, with a gunshot wound received at Fredericksburg, December 13th, the ball entering just behind the left great trochanter, but not emerging. A probe following the track of the ball made an *obtuse* angle of about 115° with the shaft of femur. A small fragment of bone was found splintered from the great trochanter and extracted.

"*Jan.* 3. I discovered tenderness and a point of hardness at upper border of left nates, which was suspected to be the ball, but from its great depth under the muscles, it was impossible to determine. I conferred with two surgeons, who dissented, on the ground that the ball, if there, *must have glanced at an acute angle*. Still, not being able to account for the tender and indurated spot, and the operation being unattended with danger, I cut down two inches through the muscles, and came upon the ball, the *curvature* of which corroborated the supposition as to its direction."

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*Lupus successfully treated by Stramonium.*—Dr. JOHN HASTINGS reports (*The Pacific Med. and Surg. Journ.*, May, 1863) three cases of lupus successfully treated by stramonium. In two of the cases the bruised leaves, made into a poultice, were applied to the ulcerated surface, and afterwards stramonium used; in the third case the latter ointment was alone employed.

# INDEX.

# NEW MEDICAL BOOKS.



## BOYLSTON MEDICAL PRIZE QUESTIONS.

The Boylston Medical Committee, appointed by the President and Fellows of Harvard University, consists of the following Physicians:—

| | | |
|---|---|---|
| EDWARD REYNOLDS, M. D. | J. B. S. JACKSON, M. D. | CHARLES G. PUTNAM, M. D. |
| JOHN JEFFRIES, M. D. | J. MASON WARREN, M. D. | MORRILL WYMAN, M. D. |
| S. D. TOWNSEND, M. D. | D. H. STORER, M. D. | HENRY J. BIGELOW, M. D. |

At the Annual Meeting of the Committee on Wednesday, August 5th, a premium of Ninety Dollars, or a gold medal of that value, was awarded to HOWARD FRANKLIN DAMON, M. D., for the best dissertation on "*Leucocythæmia.*"

The following questions are proposed for 1864:—

1. *On the Treatment of Fractures without Splints.*
2. *The Remittent Fever now prevailing in the United States Army.*

Dissertations on these subjects must be transmitted, post paid, to Edward Reynolds, M. D., *on or before the first Wednesday of April*, 1864.

The author of the best dissertation considered worthy of a prize for 1864, will be entitled to a premium of *ninety dollars*, or a gold medal of that value.

BOYLSTON MEDICAL PRIZE QUESTIONS—CONTINUED.

The following questions are proposed for 1865:—

1. *Recent Advances in Ophthalmic Science.*
2. *Pyemia.*

Dissertations on these subjects must be transmitted as above, *on or before the first Wednesday in April*, 1865.

The author of the best dissertation considered worthy of a prize on either of the subjects proposed for 1865, will be entitled to a premium of *ninety dollars*, or a gold medal of that value.

Each dissertation must be accompanied by a sealed packet, on which shall be written some device or sentence, and within which shall be inclosed the author's name and residence. The same device or sentence is to be written on the dissertation to which the packet is attached.

The writer of each dissertation is expected to transmit his communication to the Chairman of the Committee, in a legible handwriting, within the time specified.

All unsuccessful dissertations are deposited with the Secretary, from whom they may be obtained, with the sealed packet unopened, if called for within one year after they have been received.

By an order adopted in 1826, the Secretary was directed to publish annually the following votes:—

1st. That the Board do not consider themselves as approving the doctrines contained in any of the dissertations to which premiums may be adjudged.

2d. That in case of publication of a successful dissertation, the author be considered as bound to print the above vote in connection therewith.

J. MASON WARREN,
*Secretary.*

Publishers of newspapers and medical journals throughout the country are respectfully requested to notice the above.

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## HARVARD UNIVERSITY.

### MASSACHUSETTS MEDICAL COLLEGE.

The annual course of Medical Lectures of Harvard University will commence at the Massachusetts Medical College, in North Grove Street, Boston, on the first Wednesday of November, 1863. The regular course will be as follows:—

| | | |
|---|---|---|
| Obstetrics and Med. Jurisprudence, | by Professor | D. HUMPHREYS STORER, M. D. |
| Morbid Anatomy, . . . . | " " | JOHN B. S. JACKSON, M. D. |
| Clinical Medicine, . . . . | " " | HENRY I. BOWDITCH, M. D. |
| Anatomy and Physiology, . . | " " | OLIVER W. HOLMES, M. D. |
| Theory and Practice of Medicine, | " " | GEORGE C. SHATTUCK, M. D. |
| Surgery, . . . . . . . | " " | HENRY J. BIGELOW, M. D. |
| Chemistry, . . . . . . | " " | JOHN BACON, M. D. |
| Materia Medica . . . . | " " | EDWARD H. CLARKE, M. D. |

Demonstrator, DAVID W. CHEEVER, M. D.

Clinical, Medical, and Surgical Instruction will be given at the Massachusetts General Hospital, with Surgical Operations.

Collateral special medical instruction will also be given at the Hospital by Lectures and otherwise, by Drs BOWDITCH, ABBOT, and ELLIS.

Abundant material is afforded for the study of Practical Anatomy. The Room devoted to this department is open day and evening, and lighted by gas.

Fees for the Lectures, $85; Matriculation fee, $3; Graduation fee, $20.

Good Board can be obtained at $2 50 to $5 00 per week. Boarding places provided on application to the Janitor at the College.

Students are requested, upon coming to Boston, to call upon the Dean.

D. HUMPHREYS STORER, *Dean of the Faculty.*

July, 1863. *No.* 132 *Tremont Street, Boston.*

[July and Oct.]